1. PROJECT DESCRIPTION:

Project Name	**BONGABONG RIVER DREDGING PROJECT WITH RIVER DELTA CLEARING**
Project Location	The western portion of the river is within Barangay Poblacion & Barangay Sagana while the eastern portion of the river is within Barangay Anilao, Municipality of Bongabong, Province of Oriental Mindoro
River Dredging Zone	Area – 124.76 hectares with length of 7,800 linear meters Volume – 4,441,468.63 cubic meters
Marine / Navigational Zone	Area – 50 Hectares Volume – (TBD) cubic meters
Estimated Operation Duration	2-3 years – River Dredging Zone (TBD) days – Navigational Zone (river delta clearing)
Extraction Rate	2,000 m^3 per hour capacity Cutter-Suction Dredger
Projected annual extraction / production	**1.5 million cubic meters per year** of dredged material during the maximum operation
Project Proponent	**SMC Shipping and Lighterage Corporation** Mr. Thomas A. Tan – Chairman & President
Proponent Address	Lot 4-6 Block 9, Fernando Street corner Francisco Seiro Street, Manila Harbour Center, Tondo, City of Manila Telephone No. 02-85503637
EIA Preparer / Consultant	**BLACKGEAR ENVIRONMENTAL & ENGINEERING SERVICES** **Engr. Julius Marino O. Cariño** Mechanical Engineer / EIA Preparer – IPCO No. 089 2964-B Garong St., Brgy. 8, San Jose, Occidental Mindoro Mobile Number: +639277391727 Email Address: jmcarino77@gmail.com

The purpose of **BONGABONG RIVER DREDGING PROJECT** is to increase the conveyance capacity of the Bongabong River Channel through deepening and widening of the river channel based on the approved dredging masterplan of the DPWH and restore the natural state and water flow of the heavily silted Bongabong River and to maintain the navigability of the channel. Dredging will mitigate the risk of flooding in the surrounding areas or communities and eventually focus on the restoration and rehabilitation of the said river. The aggregates / spoils of dredging will be temporary stockpiled / embanked on reclaimed area and riverbank to prevent future flooding. The dredging channel which requires slope protection shall be protected by sand

bagging / geotextile retaining wall on both sides of the riverbanks in order to prevent erosion with the supervision and approval of DPWH.

Bongabong River Basin that encompasses the Municipality of Bongabong is located in the Southeastern part of Oriental Mindoro as shown in Figure C-1. The basin has a catchment area of 396 km2 according to DENR River Basin Control Office (DENR-RBCO, 2015). It is recorded to have a total population of 62,271 people based on the 2010 census of National Statistics Office.

Its main stem, Bongabong River, is part of the 45 river systems in Southern Luzon under the PHIL-LiDAR partner HEI, the University of the Philippines Los Baños. The delineated extent of the Bongabong River channel has an estimated length of 22.7 km starting from Brgy. Lasan to the boundary of Bongabong River and Tablas Strait. It is bounded by Brgy. Formon to the North; by Tablas Strait to the East; by Brgy. Lisap to the West; by Brgy. San Vicente to the South. The vicinity along Bongabong River reflects medium to high susceptibility of flooding according to the 2012 Mines and Geosciences Bureau (MGB)'s hazard maps. Recent flooding event occurred last December 9, 2014 caused by Typhoon Ruby which also led families to evacuate from their communities.

Bongabong River Basin is a 45,000-hectare watershed located in Oriental Mindoro. It covers the barangays of Ligaya, Malisbong, San Agustin and Tuban in Sablayan municipality; Conrazon, Malo, Manihala and Rosacara in Bansud; Anilao, Batangan, Formon, Hagan, Hagupit, Lisap, Luna, Malitbog, Mapang, Masaguisi, Mina de Oro, Morente, San Isidro, San Jose, San Juan, Sigange and Tawas in Bongabong; Macario Adriatico, Manguyang and Mirayan in Gloria; and, Bonbon and San Vicente in Mansalay and Roxas, respectively. The basin area has twelve geological classifications including Basement Complex, Recent, Upper Miocene-Pliocene, Oligocene-Miocene, Cretaceous-Paleogene, Paleocene-Eocene, Oligocene, Jurrasic, Pliocene-Pleistocene and Neogene. Moreover, the river basin is generally characterized by 30-50% slope and elevation of 500-750 meters above mean sea level. Bongabong River Basin is also characterized by six soil types including Maranlig gravelly sandy clay loam, Buguay loamy sand, San Manuel silt/silt Loam, Maranlig loam, San Manuel sandy loam and Cabangan sandy loam. On the other hand, about ten land cover types exists in the area including open forest, annual crop, built-up, grassland, mangrove forest, open/barren, perennial crop, shrubs and wooded grassland.

Bongabong River passes through Ligaya, Malisbong, San Agustin and Tuban in Sablayan; Conrazon, Malo, Manihala and Rosacara in Bansud; Anilao, Batangan, Formon, Hagan, Hagupit, Lisap, Luna, Malitbog, Mapang, Masaguisi, Mina de Oro, Morente, San Isidro, San Jose, San Juan, Sigange and Tawas in Bongabong; Macario Adriatico, Manguyan and Mirayan in Gloria; and, Bonbon and San Vicente in Mansalay and Roxas, respectively. As recorded in the 2010 NSO Census of Population and Housing, among the

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barangays in Sablayan, Ligaya is the most populated, Conrazon in Bansud, and Lisap in Bongabong.

According to the Mines and Geoscience Bureau, the barangays at high-risk during landslides are in Sablayan, Bansud, Gloria, Mansalay and Roxas; Batangan, Formon, Hagan, Lisap, Malitbog, Masaguisi, San Juan, Sigange and Tawas in Bongabong. Based on the field surveys conducted by the PHIL-LiDAR 1 validation team, there were eight notable weather disturbance that caused flooding in 1993 (Monang and Manny), 2009 (Ondoy), 2013 (Yolanda), 2015 (Nona), and 2016 (Nina).

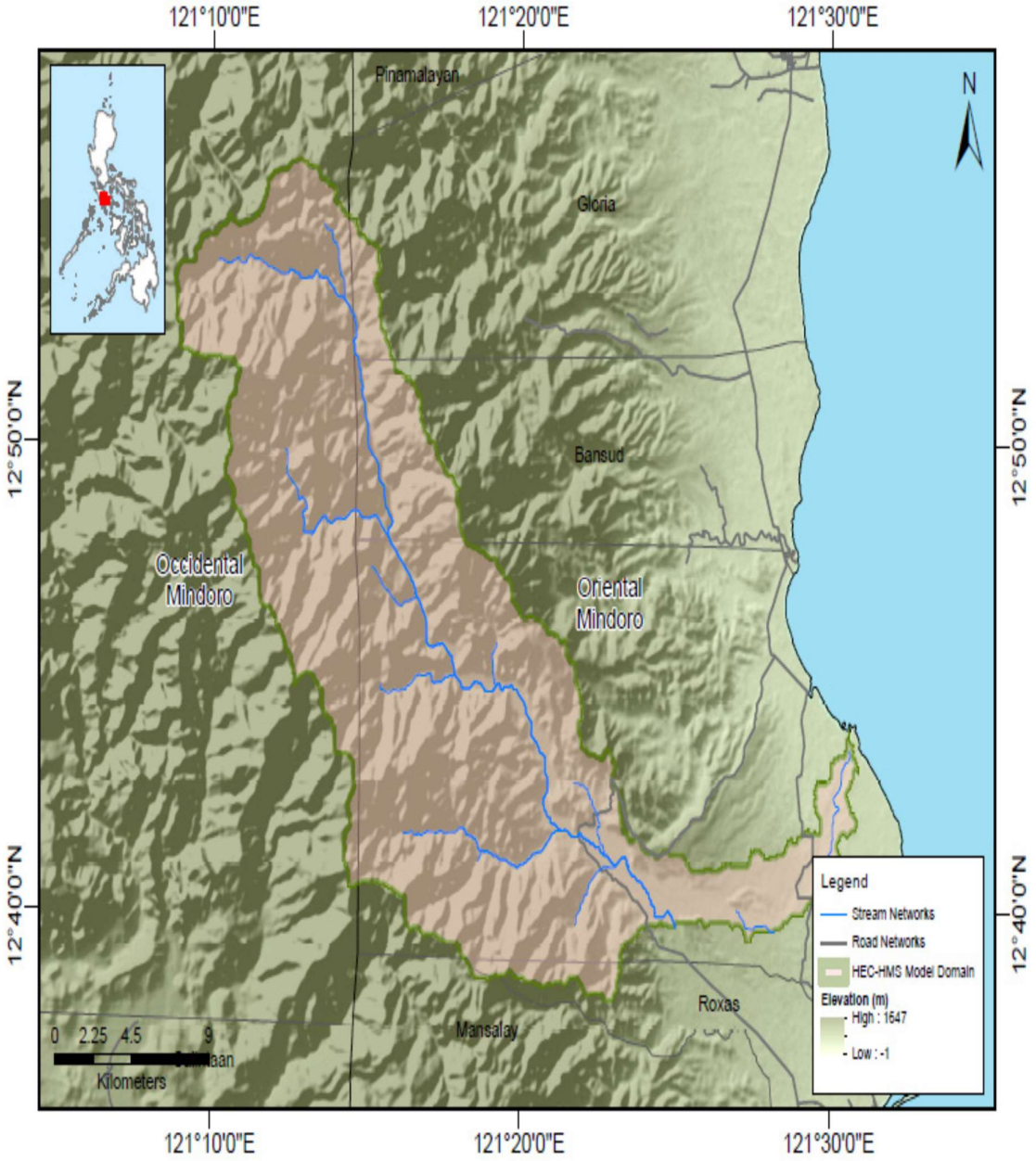

Figure 1_Map of Bongabong River Basin (in brown). **Source:** *LiDAR Surveys and Flood Mapping of Bongabong River (Phil-LIDAR 1)*

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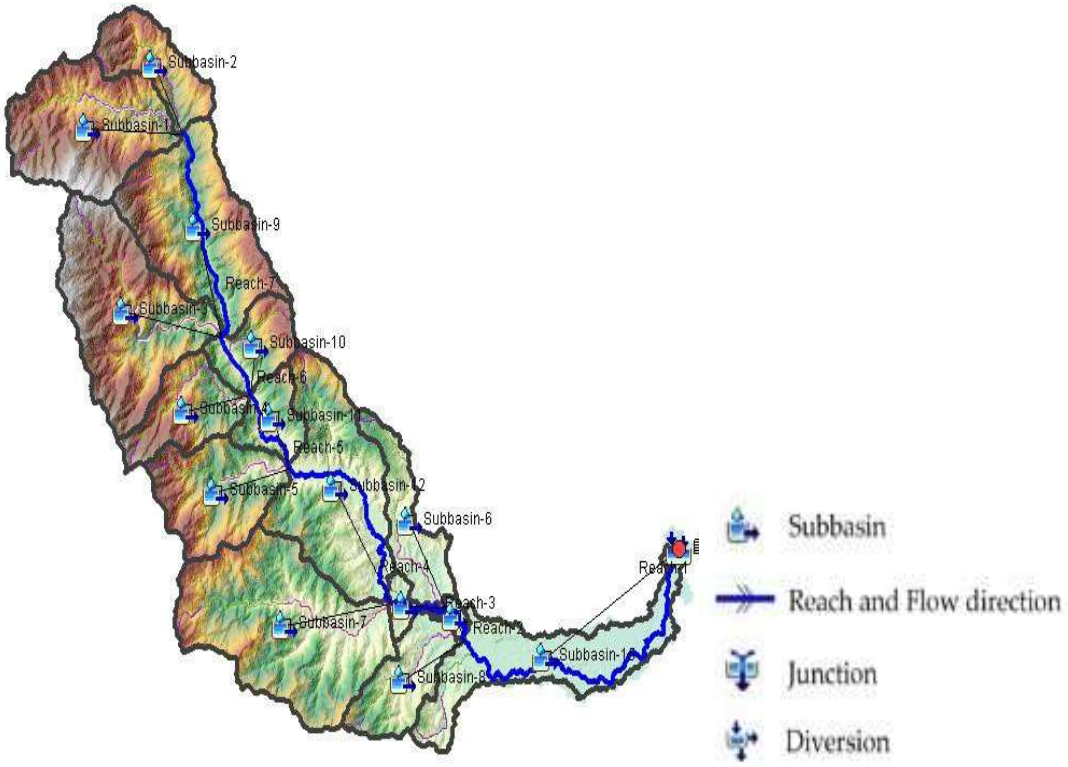

Figure 2_Delineated Watershed of Bongabong River showingelevation (meters). **Source:** Hydrologic Modelling and Technical Analysis for the Proposed Rehabilitation / Improvement of Riverbed at Bongabong River, Municipality of Bongabong, Province of Oriental Mindoro

Thus, a 2,000 cubic meters per hour capacity Cutter-Suction Dredger (CSD) equipped with state-of-the-art technology shall be employed to dredge the river mouth and its attributes. On the portions and sections where the CSD cannot perform, Long Arm Excavator with bucket capacity of 1.5 cubic meter will be employed in removing river run materials of the subject river to increase the carrying capacity of the river, resurface the river water and restore aquatic habitat and vegetation as well as to ensure the safety of the nearby residential communities from flooding hazard.

The Local Government Code empowers the province to do preventive actions or implement risk reduction by way of providing services to the people in the form of drainage, sewerage, flood control, reclamation projects, and other emergency measures, as may be necessary during and in the after-math of man-made and natural disasters. Thus, the Inter-Agency Committee (IAC) headed by Provincial Government of Oriental Mindoro together with DPWH-MIMAROPA, DENR-MIMAROPA, MGB-MIMAROPA and EMB-MIMAROPA concluded Resolution No. 04 series 2022 dated December 6, 2022 attached as **Annex A** that authorizes **SMC Shipping & Lighterage Corporation** to dredge the mouth, lower reaches and the upstream of Bongabong River including the marine area (to open the river mouth).

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Photo No. 1_Panoramic view of the river delta or the mouth of BONGABONG RIVER using DJI Mavic 2 Zoom Drone. Note that the mouth or the river delta was stalled by silt materials or sediments that prevents the flow of the water including the river run materials to the receiving Tablas Strait causing it to distribute its load to other low-lying area as seen in the photo.

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Photo No. 2_Panoramic view of the BONGABONG RIVER using DJI Mavic 2 Zoom Drone showing its distributary stalled by silt materials or sediments.

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Photo No. 3_Another view or angle of the distributary of BONGABONG RIVER.

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Photo No. 4_Geotagged photo of the Bongabong River mouth / delta taken at Barangay Poblacion side showing a shallow and heavily silted opening.

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Photo No. 5_Another angle or view of Bongabong River mouth / delta taken at Barangay Poblacion side showing a shallow and heavily silted opening.

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Photo No. 6_Geotagged photo showing an access road to the Quarry Area of former SB Member Teodoro Ramirez and his son Teodorico Ramirez located at Barangay Sagana Area.

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Photo No. 7_Another view showing an access road to the Quarry Area of former SB Member Teodoro Ramirez and his son Teodorico Ramirez located at Barangay Sagana Area.

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Photo No. 8_Geotagged photo showing Bongabong River looking south from the access road of the quarry area.

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Photo No. 9_Geotagged photo showing Bongabong River looking northeast from the access road of the quarry area.

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Photo No. 10_Geotagged photo showing "giant bamboo seedling" the planting activity for dredging contractors organized by Gov. Dolor to the riverbanks of Bongabong River.

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B.1 EIA Team

The company through Mr. Louie Sioson, engages the services of an environmental consultants to ensure that proper environmental management, protection and awareness are truly gathered and be implemented.

Different science and engineering disciplines collaborated to the project that includes Mining Engineer, Hydrologist, Marine Biologist, Civil / Sanitary Engineer, Electrical Engineer, Mechanical Engineer, Geologist, Geological Engineer and Civil-Geotechnical Engineer.

The EIA preparation team consists of the following members:

Table No. 1 EIA Team

NAME AND DESIGNATION	PARTICIPATION IN EIA STUDY
Proponent Team	
SMC Shipping and Lighterage Corporation Mr. Thomas A. Tan Chairman & President	Authorized signatory, Project Planning and Implementation
Mr. Julius Canarias Operations / Geologist	Provided all documents, data and information relevant to the project
Mr. Alberto Alastre Community Relations Officer	Project coordination and Site Technical Assistance
Key EIA Consultants	
Engr. Julius Marino O. Cariño Mechanical Engineer EIA Preparer – IPCO 089	EIA Team Leader Report Integration, Environment, Socio-Economics & Coordinator
TERMS Concrete and Materials Testing Laboratory **Miguel Dimadura** Civil / Geotechnical Engineer	Sub-surface Geotechnical Investigation
Benjamin Francisco – Leader Marine Biologist – IPCO 038 **Victor L. Pantaleon** Biologist **Ronald T. Pocon** Marine Biologist / Scuba Diver	Freshwater & Marine Ecology Baseline Assessment
Optimal Laboratories, Inc. **Christian Bryan Aguda** Team Leader	Air and Noise Sampling Freshwater and Seawater Analysis

1.1 Project Location and Area:

Bongabong River to be dredge and restore is located within Barangay Poblacion, Barangay Sagana and Barangay Anilao in the Municipality of Bongabong, Province of Oriental Mindoro.

Bongabong is a 1st-class municipality situated in the southeastern portion and one of the booming local economies in the Province of Oriental Mindoro. It has 36 barangays namely: Anilao, Aplaya, Bagumbayan I, Bagumbayan II, Batangan, Camantigue, Bukal, Carmundo, Cawayan, Dayhagan, Formon, Hagan, Hagupit, Ipil, Kaligtasan, Labasan, Labonan, Libertad, Lisap, Luna, Malitbog, Mapang, Masaguisi, Mina de Oro, Morente, Ogbot, Orconuma, Poblacion, Pulosahi, Sagana, San Isidro, San Jose, San Juan, Santa Cruz, Sigange and Tawas. It is a go-to destination of historical / cultural sites and great outdoor areas and natural wonders. Based on 2020 Census it has 76,973 friendly locals including 15,000 Indigenous People from two Mangyan tribes.

The Municipality of Bongabong with its immense land area spanning 49,820 hectares is hailed as the Center of Organic Farming in the Province of Oriental Mindoro including cultivation of the soil for the growing of crops and the rearing of animals to provide food and other products. Thru the leadership of its Local Chief Executive, Bongabong is committed to foster and promote the development of sustainable food systems based on the organic philosophy and principles.

On the 19th of March of each year, the Municipality of Bongabong turns to its festive mood and jovial atmosphere as it celebrates its town fiesta - the Sulyog Festival, which is a day of thanksgiving for a bountiful harvest of the local farmers. The word "sulyog" is a portmanteau of the two words "suli," the Mangyan word for banana, and "niyog." It coincides with the Feast Day of the municipality's patron saint St. Joseph.

The town of Bongabong is at present one of the most progressive and fast growing municipalities in the province of Oriental Mindoro with a total land area of 49, 820 hectares and stretching far and wide crossing the vast agricultural lands from the boundary of Barangay Sumagui, Municipality of Bansud, Oriental Mindoro starting at "Dalapian Creek" to Bato crisscrossing two long rivers up to the interior of the so-called "Bongabong River" ending at Barangay Morente and Batangan at the South before Roxas town."

Based on the "DPWH Hydrologic Modelling and Technical Analysis Report 2023 for the proposed BONGABONG RIVER DREDGING PROJECT" conducted by DPWH MIMAROPA given to a dredging contractor – SMC SHIPPING & LIGHTERAGE CORPORATION with the following coordinates

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on the table listed below with varying elevation starting from 0 meter at the mouth to 4-8 meters at the middle and 19 meters above mean sea level (amsl) at the upstream of the subject river.

Table No. 1_Geographic coordinates of the dredging area (using WGS 84 datum).

Corner	Latitude	Longitude
1	12°44'12.08"	121°30'60.00"
2	12°43'56.44"	121°30'42.58"
3	12°43'31.90"	121°30'40.59"
4	12°43'13.60"	121°30'35.87"
5	12°42'57.34"	121°30'32.78"
6	12°42'51.04"	121°30'19.15"
7	12°42'38.48"	121°30'18.43"
8	12°42'27.73"	121°30'11.85"
9	12°42'23.48"	121°30'5.21"
10	12°41'31.04"	121°30'10.37"
11	12°41'26.09"	121°30'8.81"
12	12°41'16.09"	121°30'0.37"
13	12°41'2.50"	121°29'44.22"
14	12°40'36.89"	121°29'27.89"
15	12°40'42.30"	121°29'24.71"
16	12°41'7.55"	121°29'42.01"
17	12°41'20.74"	121°29'58.00"
18	12°41'31.91"	121°30'5.36"
19	12°42'23.31"	121°29'59.03"
20	12°42'29.83"	121°30'2.47"
21	12°42'33.22"	121°30'10.59"
22	12°42'49.65"	121°30'13.51"
23	12°42'58.50"	121°30'24.27"
24	12°43'1.90"	121°30'30.29"
25	12°43'18.17"	121°30'30.45"
26	12°43'35.94"	121°30'35.86"
27	12°43'56.51"	121°30'36.13"
28	12°44'17.07"	121°30'55.15"

Approximately 124.76 hectares with a length of 7,800 linear meter of RDZ

Table No. 2_Geographic coordinates of the marine area

Corner	Latitude	Longitude
1	12°44'22.95"	121°30'48.57"
2	12°44'36.08"	121°31'7.14"
3	12°44'20.95"	121°31'25.59"
4	12°44'6.74"	121°31'4.93"

Marine Area / Navigational Zone – 50 hectares (approximately)

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1.1.1 Impact Areas

The area subject for Environmental Impact Assessment (EIA) Study was based on the perceived direct and indirect impact areas of the proposed dredging project is from the navigational zone (to open the river delta), mouth, lower reaches and portion of upstream of Bongabong River as identified by the consultants during the site inspection and verification.

As stipulated in DAO No. 2003-30, direct impact area for the dredging & desilting project is considered as the shoreline, marine area or navigational zone, riverbank, freshwater ecosystem, estuarine area, temporary stockpiles of dredged materials, site office including support facilities and the host barangays – residents of Barangay Poblacion, Barangay Anilao and Barangay Sagana specifically all along the 1.5-kilometer radius from the Navigational Zone due to the movement of vessels and 100 meters on both sides of the River Dredging Zone due to the air and noise pollution including possible erosion of banks where it will be altered in terms of physical environment while the indirect impact area is identified as those or outside of the primary impact area, which is identified as the nearby barangay, farmlands, users of water (local irrigators, if any), existing quarry permit holders, local fisherfolks, residential areas and other users of river water including barangay access roads. The project is far from the identified Protected Areas and RAMSAR Site in Oriental Mindoro as enumerated on Table No. 3.

The combined impacts of the proposed development and the existing developments in the area can be more accurately defined, once the project activities commence including the Environmental Monitoring Plan (EMoP). These impact areas are specific to the project but the effects or influences in the other developments in the vicinity of the proposed project site could potentially contribute the cumulative impacts on the environment.

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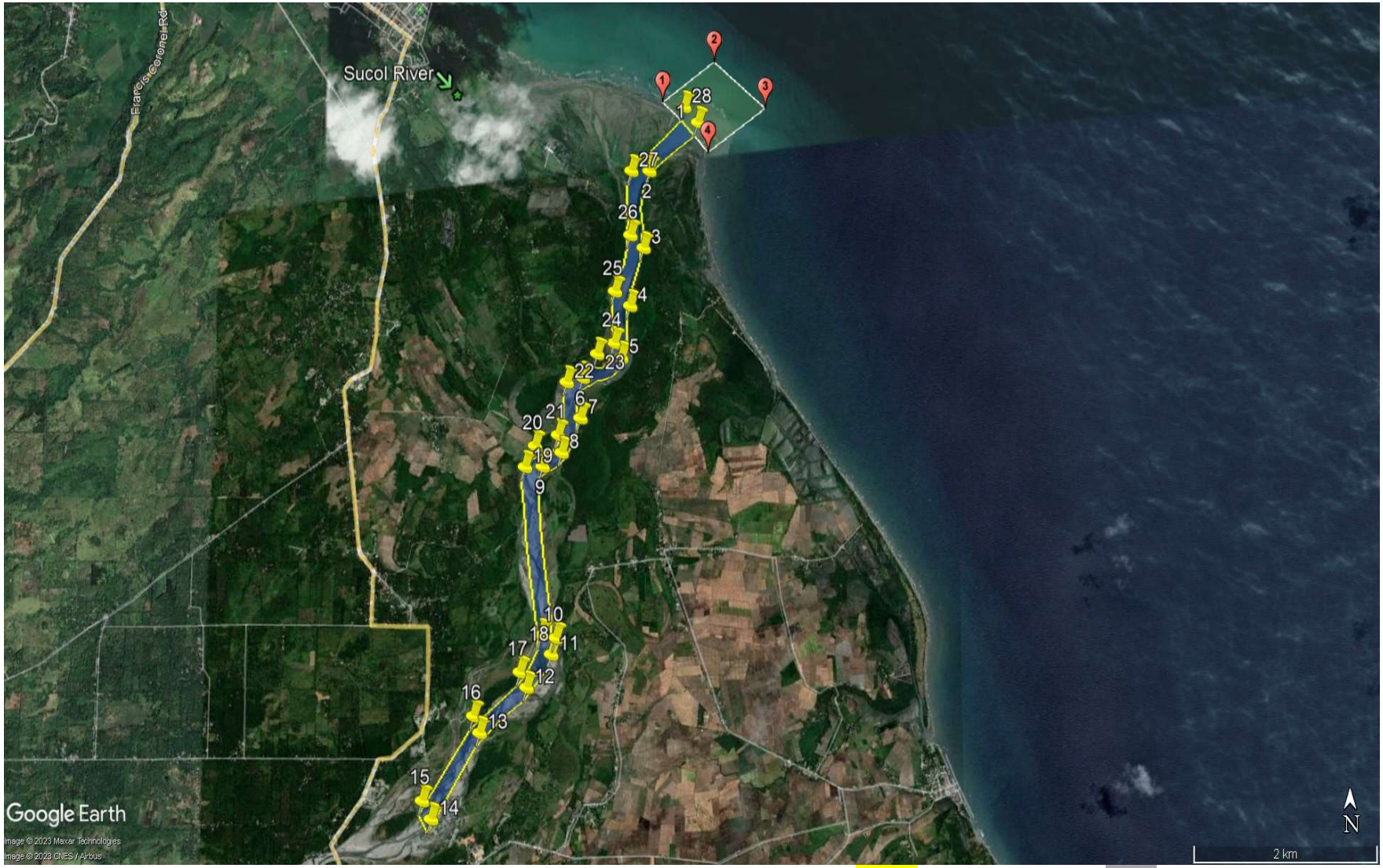

Figure 3_ Satellite Image showing the geographical coordinates of the project area **(RDZ – yellow and Navigational – white polygon, respectively).**

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Figure 4_ Satellite Image showing the **River Dredging Zone** of Bongabong River based on the DPWH Dredging Master Plan.

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Figure 5_The Direct Impact Area is the 100 meters represented by the white polygon on both side of the dredging area.

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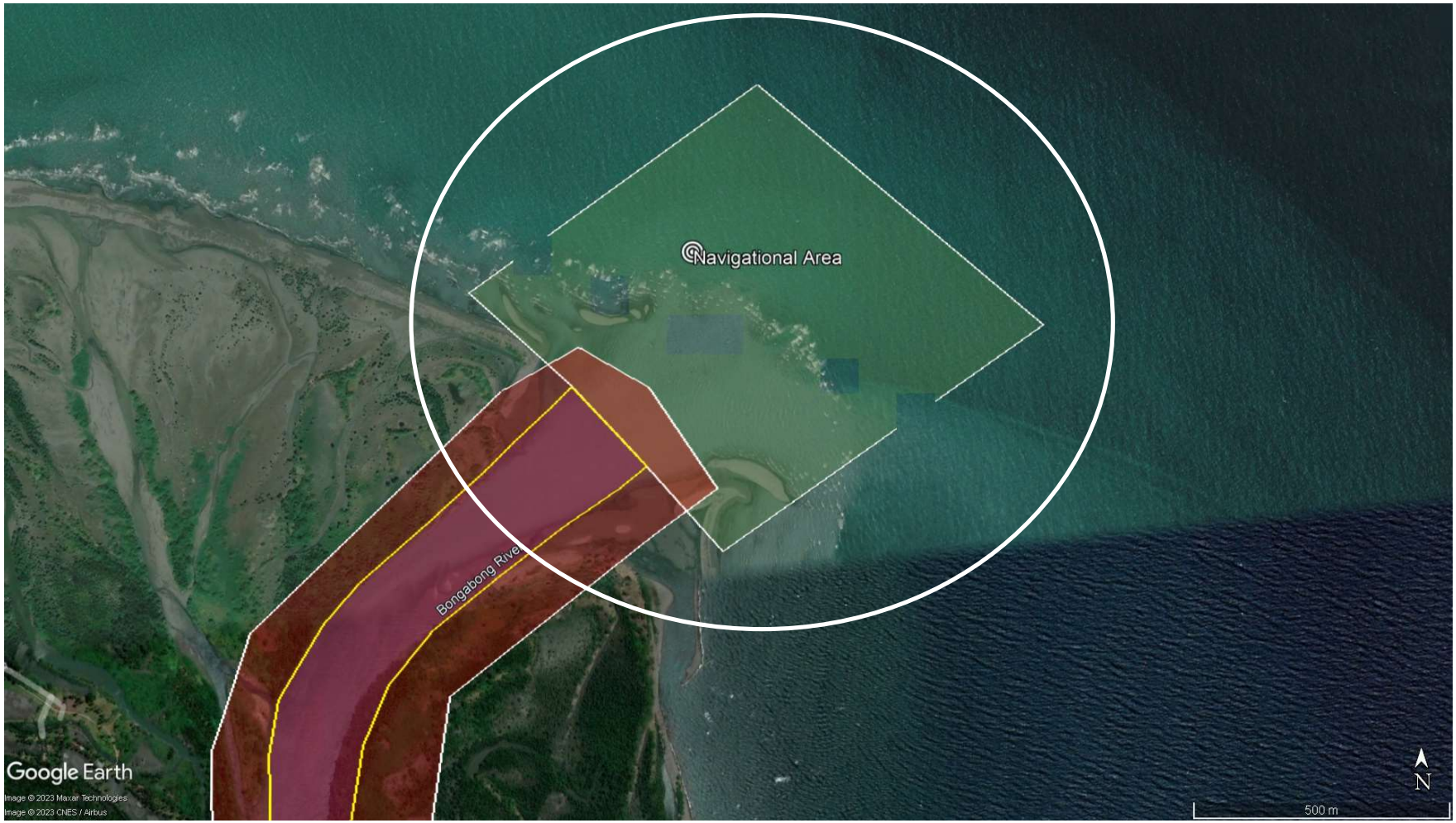

Figure 6_The Direct Impact Area within the 1.2-kilometer diameter of the dredging area's navigational zone.

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Figure 7_Barangay Poblacion area of jurisdiction regarding Bongabong River Dredging Project.

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Figure 8_Barangay Anilao area of jurisdiction regarding Bongabong River Dredging Project.

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Figure 9_Barangay Sagana area of jurisdiction regarding Bongabong River Dredging Project.

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Figure 10_Location of Protected Areas and RAMSAR Sites in the Province of Mindoro

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1.1.2 Protected Areas and RAMSAR Sites

Table No. 3_List of Protected Areas and RAMSAR Sites in the Province of Mindoro:

Name	Legal Basis	Legal Status	Proximate Distance from the Project Area
Naujan Lake National Park	Proclamation No. 335, s. 1968	Initial Component	47.54 aerial kilometers northwest of the project area
Mangrove areas of Mamburao River	Proclamation No. 2152, s. 1981	Initial Component	114.38 aerial kilometers northwest of the project area
Mangrove areas of Buluangan River to Lagarum River, Naujan			71.67 aerial kilometers northwest of the project area
Mangrove areas of Bank of Betel Creek, Sablayan Pt. to Bagong Sabang River			79.57 aerial kilometers northwest of the project area
Mangrove areas of Labangan to Calalayuan Pt.			62.39 aerial kilometers southwest of the project area
Mangrove areas of Sukol River			2.27 aerial kilometers southeast of the project area
Mangrove areas of Casiliga River, Island of Soguicay			37.15 aerial kilometers southwest of the project area
Mts. Iglit-Baco National Park	Proclamation No. 557, s. 1969	Legislated	22.6 aerial kilometers west of the project area
Apo Reef Natural Park	Proclamation No. 868, s. 1996	Legislated	108.58 aerial kilometers west of the project area
Mt. Calavite Wildlife Sanctuary	Proclamation No. 292, s. 2000	Legislated	150 aerial kilometers northwest of the project area
Calavite & F.B. Harrison Game Refuge and Bird Sanctuary	E.O. 9, s. 1920	Initial Component	150 aerial kilometers northwest of the project area

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1.2 Project Rationale

The Local Government Code empowers the province "*to do preventive actions or implement risk reduction by way of providing services to the people in the form of drainage, sewerage, flood control, reclamation projects, and other emergency measures as may be necessary during and in the after-math of man-made and natural disasters.*"

Based on the DENR Administrative Order No. 2019-14 "Rationalizing Dredging Activities in heavily-silted river channels within the Province of Oriental Mindoro pursuant to the DENR-DPWH-DILG-DOTC Joint Memorandum Circular No. 01 series of 2019" under Section 3. Rationale and Objectives states that "*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.*" DAO 2019-14 & JMC No. 2019-10 attached as **Annex B**.

The Inter-Agency Committee (IAC) headed by Provincial Government of Oriental Mindoro together with DPWH-MIMAROPA, DENR-MIMAROPA, MGB-MIMAROPA and EMB-MIMAROPA requested for the participation of the private entities to dredge the river systems affecting the concerned communities of the entire province Oriental Mindoro at "*no cost to the government of the Republic of the Philippines*" and conducted a thorough and meticulous process of selecting private companies with qualifications and capabilities to dredge or desilt the Bongabong River.

The IAC through a selection process awards Bongabong River to SMC Shipping & Lighterage Corporation as the Dredging Contractor to dredge / de-clog / desilt the river channel from the river delta all the way to the upstream including the marine area as navigational zone to open the river mouth. The dredging operation will be supervised by the DPWH District Engineer's Office to conform with the approved dredging plans.

1.3 Project Alternatives

The Inter-Agency Committee (IAC) granted the proposed dredging area to SMC Shipping & Lighterage Corporation based on the DPWH Dredging Master Plan attached as **Annex C** after complying all the necessary requirements of all the government agencies concerned.

The result of the exploration activity and other secondary information gathered at various government agencies guided the proponent to pursue the dredging and desilting project. Location was considered as the most economical sources considering vessel will navigate roughly around 190 nautical miles from prospective government infrastructure

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projects and reclamation sites within METRO MANILA, CALABARZON and MIMAROPA.

Discussion of the consequences of not proceeding with the project on a "No Project Option"

Under this scenario:

- The purpose of dredging is preventing flooding hazard that could damage the farms, properties, infrastructures and more important is the threat to the lives of residents living near the river during rainy season;
- Dredging may restore the original water depths of the subject river, where decades of siltation have significantly reduced its depth;
- It aims to carry out dredging activities to create or improve waterways and to recover silt materials or sediments for beneficial use;
- The opportunity for social development of the community of the host barangay through additional employment of qualified residents as well as livelihood projects, skills training, scholarship programs and medical assistance will be lost;
- In addition, the substantial increase in local taxes and revenues, multiplier effect of the project such as business opportunities, support to social services and other opportunities for the community and the Local Government Unit (LGU) will also be foregone.

The possibility of expanding and upgrading LGU's basic infrastructure services and facilities and strengthening of LGU's capacity in local governance, investment planning, revenue generation and project development and implementation will not also be realized. This may also include possibility of enhancing the capabilities for local leadership because the project can provide technical support and assistance to local leaders such as training, seminars and workshops. All of these may be provided by the project thru its tax payments, permits, clearances and Social Development Plan.

However, No Project Option would mean no additional environmental impact such as siltation, disturbance of marine environment and potential oil spill from dredging vessel and other equipment.

1.4 Project Components

The dredging operation of Bongabong River will start to deepened the marine area or navigational zone covering an area of approximately **50 hectares** for validation through Seismic Data and Bathymetric Measurement before opening the mouth of the river (delta) following the original contour or pattern of the river. The River Dredging Zone (RDZ)

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has an **area of 124.76 hectares with a length of 7,800 linear meters based on the DPWH Dredging Master Plan.**

A pre-construction survey shall be jointly conducted by DPWH Technical Staff, Provincial Engineers Office representative and Dredging Contractor including their Dredging Experts to determine the actual situation of the river and the distance of riverbanks, dikes, bridges, irrigation canals as well as other infrastructures within the project area.

SMC Shipping & Lighterage Corporation will construct temporary dikes or gabion, if necessary, as retaining walls to guarantee that it will not cause damage to any infrastructure based on the approved DPWH Dredging Master Plan. During construction of the retaining walls, sand materials shall be excavated with a depth that varies from 2 meters up to 3 meters (4 meters as maximum depth) on the line of dredging area. The dredging channel shall be protected by sand bagging both sides in order to prevent erosion. Sounding shall be conducted every 100 meters of the dredge channel for the calculation of volume or by drop survey of vessel. For safety of all workers and crew during typhoon season or if there are announcement of tropical depression or huge swelling to arrive at Tablas Strait, the Engineers shall suspend the dredging activities and vessel shall automatically hide their barges, vessel and suction dredger to a safer place at Roxas Port. The DPWH Technical Staff as well as the Provincial Engineers Office representative shall monitor the conventional method and dredging operation up to 24 hours per day for 8 up to 10 months or as long as the weather permits.

The operation involves the eventual dredging of about **4,441,468.63 cubic meters of dredged materials** (sand and/or river-run / dredged materials) for the combined production during the maximum operation based on the calculated quantity of deposits. The Cutter-Suction Dredger has a capacity of 2,000 cubic meters per hour to deal with the time and amount of river materials to be dredge / de-silt from the above-mentioned rivers due to the unpredicted weather condition nowadays. The materials dredged from the river delta and upstream shall be discharged aboard a floating or split hopper barge through a specialized floating discharge hose or via conventional loading through long-arm excavator or clamshell-type crane.

Fuel Supply

The fuel consumption for project operations is expected to consume an estimated **22,000 liters of Diesel Fuel per day** for the Dredger, Barges and other heavy equipment will be sourced out from the locally available fuel-oil supplier onshore within the project area in the Municipality of Bongabong and nearby municipalities. No refueling stations or tanks will be constructed at the site.

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Power Supply

Power or electricity required by dredgers and its auxiliary equipment during the dredging and filling works will be sourced on-board these sea vessels.

30kVA Diesel Generator Set will be used to power the site office and its support facility. The generator set is silent-type with insulated housing to further decrease the noise level. Option 2, the power requirement / electric supply of estimated 20kWH per day can be source from Oriental Mindoro Electric Cooperative (ORMECO).

Water Supply

Water supply, on-board the vessel will be outsourced from Local Water Vendors / Tenders for washing, laundry, bathing and cooking including potable water for drinking is estimated to consume **1 cubic meter per day.**

1.5 Process / Technology Options

The dredging operation will involve simple, straightforward dredging and haul out of dredged materials. This process will be repetitive until the desired river bed elevation based on the approved DPWH Dredging Master Plan is attained. It is important to mention that dredging in itself is a mitigating process to address the perennial and increasing flooding problem in Bongabong River.
The dredging process will be implemented using heavy equipment such as a cutter suction dredger to initially break up a small channel at the river mouth to the silting / catchment basin and to remove the deposits at the dredging channel in and the river mouth.

Going upstream to non-navigable portions, the long-arm excavator with 1.5 m^3 capacity bucket and dump truck tandem shall be used in dredging. The cargo barge hauls the dredged material to the designated and permitted disposal site/s.

According to Damen Website, the dredger has the capacity to extract and pump 2,000m^3 of sand and/or river-run / dredged materials per hour. It has a 6-kilometer floating pipeline with an internal diameter of 350 mm and an overall vessel length of 26 meters. It can dredge up to 9 meters deep and 27 meters of swing angle with total installed power of 447 kW.

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Photo No. 11_This Cutter-Suction Dredger with ID "Damen CSD 350" will be employed initially in the project.

From the dredging lakes, the excavator shall extract water-laden sand and immediately stockpiled the sand near the reach of the bucket. The development of the said lakes shall be in accordance with the direction of the dredging plan. The dozer-loader shoves the sand and load it to the hauling trucks. The loaded trucks are then unloaded the sand to the floating hopper barge steadily anchored in the causeway/port until fully loaded. The barges sail towards the mother vessel to unload the sand using the long-arm excavator.

SANY SY545C-10LR is advanced 10-Series long reach excavator designed with more power & higher working ranges to fulfill the segment Customer need. SANY 55T long reach excavator provides a massive dig envelope, a stable working platform and low ground pressure. The SY545C-9 long reach excavator designed to dig deeper, with a reach of over 22m & digging depth over 16m. The powerful & fuel efficient 403hp ISUZU engine with optimized positive flow hydraulic system delivers class leading performance. Reliable & Durable major aggregates with robust structures are adopted for trouble-free longer period operation with minimum operating cost.

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Photo No. 12_Long-arm Excavator with 1.5m^3 capacity bucket for extraction of sand.

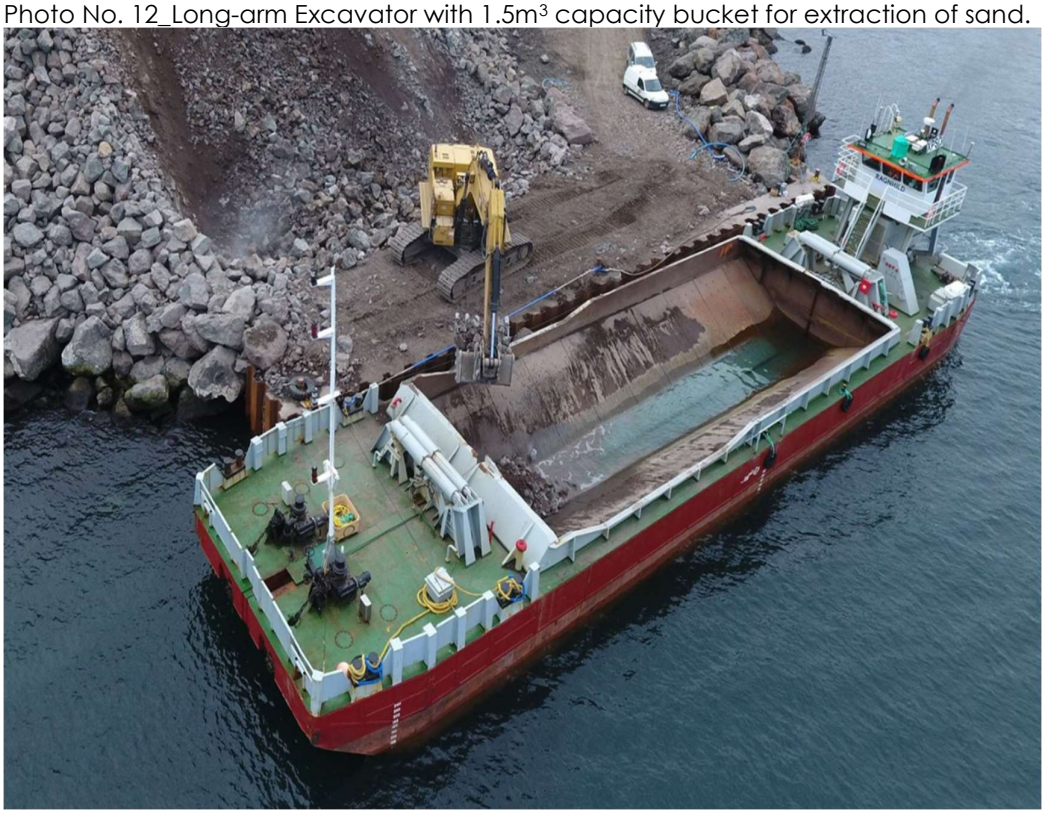

Photo No. 13_Typical Split Hopper Barge for reclamation projects.

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Photo No. 14_Using Dozer-Loader to shove sand for stockpile.

Photo No. 15_Dump truck for loading using the port to the barges.

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Navigational Traffic Scheme

The herein proponent shall follow the Rule 10 of the Convention on the International Regulations for Preventing Collisions at Sea (COLREGS). The COLREGS are the rules of the road that vessels must obey at sea to avoid collisions. The proponent shall strictly follow the international navigational traffic rules, as follows:

1. A vessel using a traffic separation scheme shall: **a.)** proceed in the appropriate traffic lane in the general direction of traffic flow for that lane; **b.)** so far as practicable keep clear of a traffic separation line or separation zone; **c.)** normally join or leave a traffic lane at the termination of the lane, but when joining or leaving from either side shall do so at as small an angle to the general direction of traffic flow as practicable;

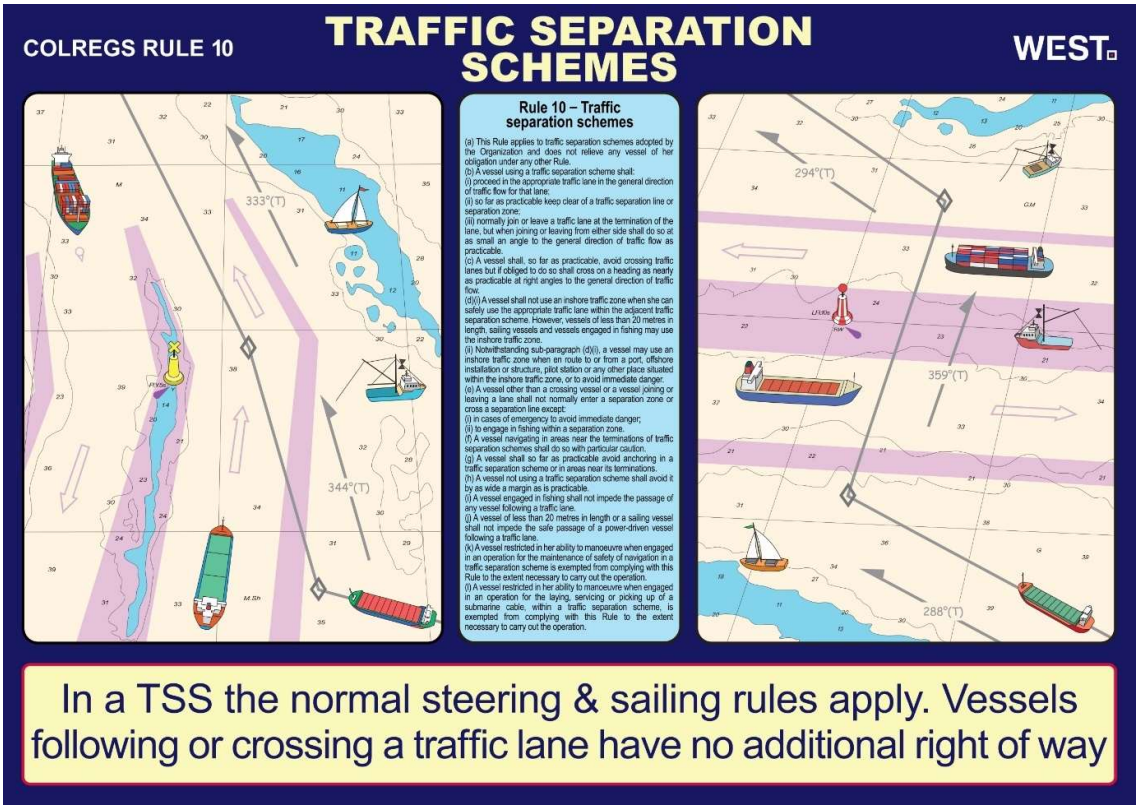

Figure 11_Schematic Form of Navigational Traffic Scheme using Rule 10.

2. A vessel shall, so far as practicable, avoid crossing traffic lanes but if obliged to do so shall cross on a heading as nearly as practicable at right angles to the general direction of traffic flow;
3. A vessel other than a crossing vessel or a vessel joining or leaving a lane shall not normally enter a separation zone or cross a separation line except: in cases of emergency to avoid immediate danger and to engage in fishing within a separation zone;

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4. A vessel navigating in areas near the terminations of traffic separation schemes shall do so with particular caution;
5. A vessel shall so far as practicable avoid anchoring in a traffic separation scheme or in areas near its terminations; and
6. A vessel not using a traffic separation scheme shall avoid it by as wide a margin as is practicable.

The Philippine Coast Guard (PCG), Philippine Port Authority (PPA) and Maritime Industry Authority (MARINA) will issue an approved Navigational Traffic Scheme for the project before its operation.

1.6 Project Size

Bongabong River Dredging Project will cover a total area of **124.76 hectares with a length of 7,800 linear meters of RDZ based on the DPWH Dredging Master Plan** that will start from the mouth of the river (delta), lower reaches up to upstream having a bottom width **55 meters Slope 1V:1H** with average depth of **2 – 3 meters (Design Depth is 4 meters)** situated at Barangay Poblacion, Barangay Anilao and Barangay Sagana within the Municipality of Bongabong in the Province of Oriental Mindoro.

The data generated during the course of the various stages of the exploration, specifically the high-resolution seismic reflection profiling, bathymetric measurements, subsurface geotechnical investigation and geological sampling through drilling were all considered in the estimation of the resource.

Based on the **Final Report on Geotechnical Investigation** attached as **Annex D** conducted by Terms Concrete Testing for DPWH MIMAROPA and **DPWH Hydrologic Modeling & Technical Analysis Report** attached as **Annex E** for Bongabong River last February 2023 and June 2023, respectively suggests that the subject river is continuing in the deposition of sediments from its mountain sources, subbasin and watershed having a **total volume estimate of 4,441,468.63 cubic meters** of combined sand, gravel, pebble and other sediments as reflected on the DPWH Dredging Masterplan.

Based on the studies / report stated above it was concluded that:

1. The peak discharges of 1,910.30 m^3/s and 2,031.50 m^3/s, corresponding to the 50-yr and 100-yr floods were simulated using the steady state one-dimensional flow of the HEC-RAS program;
2. Based on the results of the hydraulic analysis, the proposed dredging project reduces the simulated flood water levels up to about 2 meters along the 2,000-m length of the proposed dredged river for the 50-yr and 100-yr floods.

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3. Sediment transport analysis shows that at design flood scenarios, scouring will occur at the immediate upstream of the dredged river and the scoured sediments will migrate and be deposited downstream. Estimated depth of maximum scouring for the scenario "with" dredging project is 1.80 m at the Sta 3+000 for the 100-yr flood.
4. The proposed dredging project will not have direct effect on the water level and scouring at the Orconuma Bridge at Sta. 8+750.00
5. Slope stability analysis shows that the existing and the dredged geometries of the river sections pass the criteria set for all load conditions and suggest that the river sections will be stable under any of these conditions.

The volume to be excavated in the navigational zone to be able penetrate the river mouth of Bongabong River will be determined based on the Report on the Seismic Reflection Profiling and Bathymetric Measurements will be added to the total estimated volume of the proposed Bongabong River Dredging Project to conducted later on by a third-party Consultants and/or Experts.

1.7 Development Plan, Description of Project Phases and Corresponding Timeframes

Phases to be described by identifying main activities with special attention to those with significant environmental impacts and corresponding projected implementation timeframes (i.e. pre-construction, construction, operation, abandonment).

1.6.1 DESCRIPTION OF PROJECT PHASES

1.6.1.1 Pre – Development & Construction Phase

Prior to the implementation of the project, conduct of significant studies are being done. These include preliminary design, detailed engineering study, impact study to include geohazard identification and environmental impacts assessments. All the necessary information, plans, and designs will be gathered and prepared relative to the requirements and in compliance with the existing laws and regulations applicable to the project. Jurisdiction over the project site, clearances, permits and all other administrative requirements of concerned agencies will also be completed.

The proponent is in the process of securing the necessary permits, certifications and licenses from the government agencies concerned such as the DPWH, PPA-Marina, PCG, BFAR / MAO, MGB, LGU, PGOM, among others. The herein proponent is

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requesting the EMB MIMAROPA for the Environmental Compliance Certificate (ECC).

An option to have a Field Office and other support facilities like stockpile area, waste dumps area, staff house, motor pool and nursery will be constructed on a lease or acquired lot near the bank of Bongabong River (on-shore / land).

During the pre-construction phase the following activities are to be undertaken:

- Conducted a high-resolution seismic reflection profiling, bathymetric measurements, marine assessment and geological sampling, geotechnical study through drilling was all considered in the estimation of the resource;
- Topographic and Boundary Survey based on the area designated by the DPWH;
- Site Investigation for the causeway or port construction;
- Gathering of pertinent data from LGU;
- Procurement of vehicles and equipment;
- Call for tender of bids for the purpose of selecting qualified bidders as service providers for the dredging project;

A quality assurance / quality control program during construction and commissioning ensures that equipment is purchased and built according to the design requirements, while meeting all applicable legal and technical standards and codes. The dredging project is recommended to have a quality assurance/quality control program in place to prevent equipment failures that could result from:

- Use of faulty parts / materials due to improper delivery controls;
- Improper fabrication, installation, or repair methods.

The operator's manual should provide guidance and mechanisms to assure that appropriately qualified and trained personnel are used for specified vessel and piping fabrication and for installing safety critical equipment and instrumentation.

Hazard management during construction and commissioning of dredging project should have a procedure in place during the construction and the commissioning of the seabed quarry. Typically, risk assessments as described in the above section on Safety Report / Declaration also apply during the Operations Phase. Pre-Start-up Safety Reviews are often being used during commissioning.

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1.6.1.2 Dredging Operation

The dredging methods to be employed are the Cutter-Suction Dredgers from the navigational zone, river mouth and lower reaches while the Long Arm Excavator-Dozer-Dump Truck Tandem at some portion of the lower reaches until the upstream of Bongabong River to be filled or loaded to barges and/or sand carrier vessel that are on standby that take turns to be filled with the dredged materials for disposition to prospective clients in different locations.

The dredging operation is intended to remove substantial volume of river materials to ease and reduce the swelling of the river that threatens or could again damage the properties and farms within the vicinity. SMC Shipping & Lighterage Corporation will initially dredge and remove the silt at the navigational zone to open up the river mouth and to be increased gradually upon full understanding of the dynamics of the river run materials. The activity will be properly coordinated with the concerned government agencies to ensure that the objective of solving the drainage and flooding problems in the municipality will be attained.

The dredging operation shall be undertaken using:

- Cutter-Suction Dredger (CSD) having a capacity of 2,000 cubic meters per hour
- Split and/or Floating Hopper Barges
- Sand Carrier Vessel
- Long Arm Excavator with 1.5m^3 bucket capacity
- Tug Boat
- 30kVA Generator Set

Upon issuance of the ECC and other permits and clearances, the dredging site shall now be developed based on the dredging plan approved by the DPWH, as follows:

1. Construction of Site Office on a container van;
2. Perimeter boundary survey covering the 124.76-hectare with length of 7,800 linear meter river dredging zone;
3. Development of "dredging lakes" as source of sand to be extracted using backhoe. The said lake measures around 30-45 meters in diameter. Additional dredging lakes shall be added progressively.
4. Development of the stockpile area;
5. Installation of safety signs and lighting fixtures;
6. Installation of buoys and lighted markers on the 50-hectare navigational zone;

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7. Development of temporary earthen ramp to cross the nearby riverbanks;
8. An option to construct causeway or port to load the sand materials;
9. An option to install a 1000-ton per hour trestle conveyor loading facility designed to allow sand material-shipment in most weather conditions; and
10. To mobilize the required equipment together with the necessary personnel and materials to jumpstart the project.

The herein proponent shall require all personnel involved in the development and operation to implement and install safety measures such as radio communication equipment, visible safety signs, well-lighted working areas, emergency clinic and the wearing of Personal Protective Equipment (PPE's) among others.

1.6.1.3 Abandonment

The decommissioning and abandonment plan has its focus on protecting public health and safety, improving or eliminating environmental damage and liabilities, and allowing the land use to be similar to its original use or an acceptable alternative.

The decommissioning plan shall be executable at any time throughout the lifetime of the dredging activity. This plan shall also take into account environmental rehabilitation. Environmental rehabilitation shall include the removal of all surface facilities and dredging equipment at Bongabong River and Tablas Strait.

The formulation of the detailed decommissioning plan will be done by the proponent within the specified timeframe as part of the post-ECC requirement. It will be submitted for approval to the EMB MIMAROPA, IAC and all other concerned government agencies on the activities such as Environmental Site Assessment to determine contaminants left by the operation, method and equipment to be used for dismantling of structures, clean-up or remediation plan and demobilization scheme before proceeding.

The proponent shall conduct sub-bottom profiling and bathymetry, post coastal marine assessment, freshwater sampling and marine sampling prior to permanent cessation of the dredging area. Equipment, structures and other facilities will be assessed regularly for the project to continue its operation beyond its lifespan.

For purposes of compliance to ECC conditions, a detailed Abandonment Plan shall also be undertaken by the herein

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proponent for submission and approval of EMB at least six (6) months before the scheduled abandonment.

1.8 Manpower Requirements

It shall be a policy of the proponent to hire qualified local applicants based on the following order of priority.

Table No. 4_Manpower Requirement

POSITION / PERSONNEL	REQUIREMENT PER SKILL
Operation / Resident Manager	1
Captain / Dredger Operator	2
Dredging Ship Crew	10
Shift Foreman	2
Community Relations Officer	1
Safety & Pollution Control Officer	1
Quality Control Engineer	1
Mechanic & Welder	2
Accountant	1
Samplers	6
Nurse	2
Logistics	1
Clerk / Checker	2
Driver Liaison	2
Backhoe Operator	4
Bulldozer / loader Operator	2
Crew for land-based operation	10
Security Guards (on Contract)	10
Total	**60**

1.9 Indicative Project Investment Cost

The indicative project cost for the BONGABONG RIVER DREDGING PROJECT is estimated at **THREE HUNDRED NINE MILLION NINE HUNDRED FORTEEN THOUSAND (PhP309,914,000) PESOS**. A summary of the capital cost is shown on the table below.

Table No. 5_Breakdown of initial expenditures / capital cost

DESCRIPTION	ESTIMATED COST (PHP)
Permitting	8,000,000.00
Cutter-Suction Dredger (CSD)	60,000,000.00
Long Arm excavator	16,000,000.00
Barge	15,000,000.00
Tug boat	30,000,000.00
Land-based (backhoe, dozer-loader, dump trucks and other support equipment) Heavy Equipment	30,000,000.00

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Land Acquisition – On-site Office and Stockpile Area	10,000,000.00
Service vehicles and facilities	8,000,000.00
Silt Curtain	2,500,000.00
Loading line (pipes)	5,000,000.00
Screen and conveyor plant	15,000,000.00
Loading conveyor	10,000,000
Tower Light	240,000.00
Contingency allowance (10% of equipment and facilities)	20,174,000.00
Operating Cost	80,000,000.00
Total	**309,914,000.00**
Social Development Plan	TBD
Safety and Health Program	TBD
Local Taxes (OTP, Quarry Tax, Excise Tax Business Permit, etc.)	355,000,000.00

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