

*Executive Summary of Multipurpose Cargo Berth (Berth No.17) at New Mangalore Port Authority*

*Project Proponent*

**NEW MANGALORE PORT  
AUTHORITY**



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## **EXECUTIVE SUMMARY**

### **1. INTRODUCTION**

New Mangalore Port is located on the West Coast of India and managed by New Mangalore Port Authority (NMPA) previously called as New Mangalore Port Authority (NMPA). The Port is a modern all-weather port situated at Panambur, Mangalore. The Mangalore Harbour Project started in 1962 and completed in May 1974. On 1st April 1980, the Port Trust Board was set up under the Major Port Trust Act, 1963 and the same was superseded on 18th February 2021, when Government of India by notification designates all the Major Port Trust as Major Port Authority. Since then, NMPA has been functioning as the 9th Major Port Trust and has fallen in line with other Major Port Trusts functioning in the country under the administrative control of Ministry of Ports, Shipping and Waterways (MoPSW). New Mangalore Port is a deep-water port and the only major port of Karnataka. The port is approached through a 7.5 km long channel with water depths -15.4 m CD in the outer channel and -15.1 m CD in the inner channel. The Port has a total land area of approximately 822 ha. and water spread area of about 120 ha.

#### **Applicable of Environmental Clearances**

The proposed project attracts Environmental Clearance under EIA Notification 2006 and its subsequent amendments. The port handling cargo more than 5 million tons per annum is scheduled as category A and requires Clearance from MoEF&CC, New Delhi.

Also, the project falls in CRZ zone II as per coastal zone management plan of Karnataka state. Hence requires CRZ recommendations from Karnataka Coastal Zone Management Authority followed by CRZ Clearance from MoEF&CC.

### **2. PROJECT DESCRIPTION**

#### **Background and Need of the Project**

NMPA has handed over the existing multipurpose deep draft Berth No. 14 for handling container through Mechanization to PPP operator and the Port will no longer have other deep draft berth general cargo to handle the large ships of 60,000 DWT and above. Therefore, Port has proposed to develop an additional deep draft general cargo berth in between berth No.8 and No.13, named as Berth No. 17. It is proposed to handle RO-RO/ Cruise ships bunkering cargo ships Iron ore fines/concentrate, fertilizers, river sand, bentonite, gypsum, machinery, steel coil etc. at the

proposed new berth No. 17. The proposed handling capacity of the multipurpose Berth No. 17 would be 6.14 MMTPA.

### **Location of the Project Area**

The proposed location of the berth No. 17 has been identified as the existing waterfront in between berths No. 8 and berth No. 13. Site Coordinates are - Latitude  $-12^{\circ}55'26.39''\text{N}$ ; Longitude-  $74^{\circ}48'58.66''\text{E}$ .

### **Project Siting**

The proposed location of the berth No. 17 has been identified as the existing waterfront in between berths No. 8 and berth No. 13. There is a straight stretch of waterfront set back by about 40 m from the western end of berth No.8 and contained within the limit of the pump house near berth No.13. It is possible to construct a berth of at least 300 m along this waterfront.

There is a straight stretch of waterfront set back by about 40 m from the western end of berth No.8 and contained within the limit of the pump house near berth No.13. The new berth could be in alignment with the existing berth No. 8 and with the same open-piled configuration.

The existing shoreline with pitched revetment will ensure that the waves would get absorbed instead of getting reflected. This will ensure tranquility being maintained in the harbour basin. The port also agreed with this suggestion as it will have an added benefit of providing flexibility in berthing of longer vessels either at berth No.8 or at berth No. 17.

Presently the waterfront at the proposed berth No. 17 is provided with extended stone pitching to protect the shore slope. Giving due consideration to this aspect, the new berth No. 17 is located in line with the berthing face of berth No. 8. Since this berth is located offshore, it is proposed to have three approaches.



### **Proposed alignment and approach to Berth no. 17**

It can be seen that on the western side of the new berth No. 17, there is the existing berth No. 13 which handles crude oil and LPG. It is generally accepted that for LPG the distance may be at least 150 m to the other installations on safety considerations. In this particular case, the edge of berth No. 17 is more than 250 m from the transfer point of the berth No. 13. Hence there is no issue on safety.

### **Structural model for Berthing Structures**

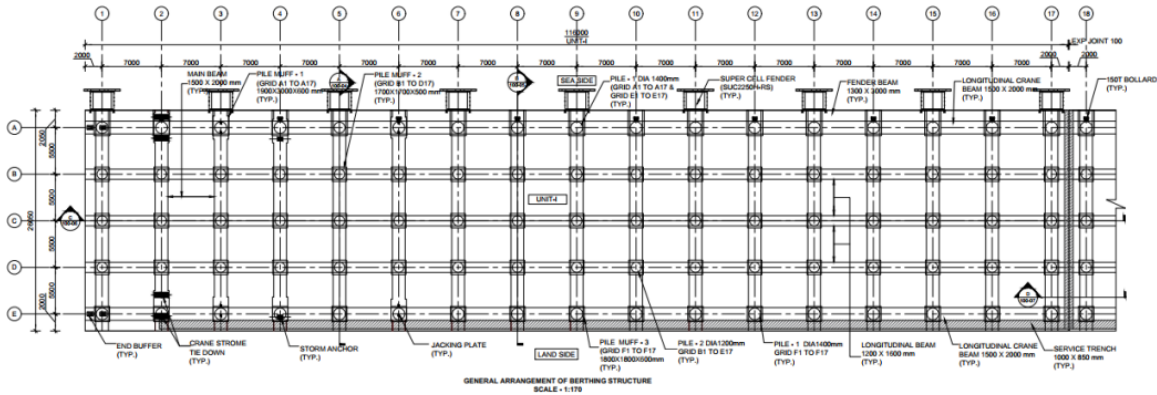
#### **General Arrangements**

The proposed General Cargo berth is for 348.2m long with two Approaches connected to the land. The dimensions of berthing structure is 348.2m long and 26.05m wide for handling deep draft general Cargos and Approach jetty dimensions of 34m x 10m with 2 side berthing is used to connect the land. 2,00,000 DWT vessel is considered for the design of proposed Berth No.17 with dimensions of 303m (LOA) x 47m (Beam) x 18.2m (Draft) and Dredging depth is considered for (-)20.0m CD in front of proposed berth for future handling.

#### **Berthing jetty**

The structural system of proposed General cargo berth (Berth No.17) consists of 5 rows of RCC Bored cast in-situ pile with diameter of 1400mm (A-1 to 51 and E-1 to 51) and 1200mm (B1, C1, D1 to B51, C51, and D51). The deck level of proposed berth is (+) 4.66m. The dimensions of the jetty structure (Unit -1/2/3) are 26.05m width and 116m in length. Service trench is provided on lee side of berthing structures, which will be the provision of water and electrical

components throughout the jetty structures. The centre-to-centre distance for Bollard and Fender arrangements is 14m. The wearing coat is considered as 100mm. The provision is given for crane anchoring in storm condition. The centre-to-centre distance for crane rail is 22m. The dredging depth is (-) 20.0m CD in front of berthing structures. Geotextile mattress and Geo bags is considered for stability of dredging depth in front of berthing structures. Behind the berth natural slope will be adopted active to land side. The founding depth of pile berthing jetty for 1.4m and 1.2m diameter are (-) 34m CD and (-)32m CD respectively. While driving the 1.4m dia. pile and 1.2m dia. pile for hard rock stratum, a minimum of 3D (3 times the diameter of the pile) should be embedded into them, respectively.



**Figure: General arrangements of Berthing Structure and Approach Structures**

### Storage Area

During the initial stages of operation of this new berth No.17, it will be handling only the displaced cargo from the berth No. 14. Of the dry bulk cargo handled there, it is understood that iron ore fines/concentrates, limestone, gypsum, fertilizers etc. all move directly to their respective destination and are not stored within the port. Only sand is being stored.

### 3. BASELINE ENVIRONMENT

Baseline environmental status has been established for various environmental attributes within a study area of 10 km radius from the project site. The study of area includes ambient air quality, water quality, marine water quality, sediment quality, noise, soil, ecology (terrestrial and aquatic/marine), land use, geology, hydrology and demographic & socio-economic conditions.

The baseline data has been collected as per MOEF&CC/CPCB guidelines for three seasons – December 2021 to February 2022; March 2022 to May 2022 and October 2022 to December 2022.

### **Ambient Air Quality**

The ambient air sampling was carried out at 8 different locations so as to determine the ambient air quality. The selected Sampling stations includes the near project site, downwind, upwind and cross wind spread across catchment, command and submergence. Assessment of the ambient air conditions has been done by studying the air quality at 8 different locations for three Seasons (December 2021-February 2022, March - May 2022 and October- December 2022). The values of PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub> & NO<sub>x</sub> observed in the project area and in the surrounding study are within the prescribed limits of NAAQ.

### **Noise Quality Level**

The noise monitoring has been conducted for determination of noise levels at 8 locations in the study area. The main objective of the noise monitoring was to establish the baseline noise levels with respect to standards. The noise samples were collected in day time for 8 hours with sound level meter. The sampling locations were spread in within 10 km radius of the proposed activities. The overall noise levels in the project area are well within the limits as per ambient noise standards.

### **Surface Water Quality**

The surface water sampling was carried out at 2 different locations so as to determine the surface water quality. The analysis results indicate that the pH values in the range of 7.3-7.6, DO was observed to be in the range of 4.7-5 mg/l. The chlorides and Sulphates were found to be in the range of 56-71 mg/l and 53-56 mg/l which is under prescribed limit.

### **Ground Water Quality**

The ground water sampling was carried out at 5 different locations so as to determine the ground water quality. The analysis results indicate that the pH ranges in between 7.4 to 7.8, which is well within the specified standard of 6.5 to 8.5. Chlorides were found to be in the range of 57-133 mg/l, Sulphates were found to be in the range of 62 to 90 mg/l, The Total Dissolved Solids (TDS) concentrations were found to be ranging in between 428-692 mg/l

## Soil Quality

A total of 5 samples within the study area were collected and analyzed. The soil samples were examined for various parameters (viz pH, electrical conductivity, chloride, available calcium & magnesium, phosphorus, exchangeable sodium & potassium, available nitrogen etc.). Soil in the study area is Sandy loam to sandy clay loam, The soil being of friable consistency, the bulk density & water holding capacity of the soil in the range of 1088 to 1143 kg/m<sup>3</sup> & 52.6 -57.1 respectively. The pH of the soil in the study area is slightly acidic to slightly alkaline in reaction having pH is in the range of 6.3-7.5.

## Ecology and Biodiversity

Flora: Cashew, Cocoa, Casuarina, Rubber, Ailanthus, Acacia auriculiformis, Vateria indica Nutmeg, Clove, Oil palm, Teak, Bamboo Cane, Areca nut etc. have been raised successfully Natural vegetation in the study area prominently consists of *Hopea parviflora*, *Vateria indica*, *Diospyros microphylla*, *Eugenia gardnei*, *Aporosa lindleyana*, *Olea dioica*, *Syzygium species*, *Terminalia paniculata*, *Lagerstroemia lanceolata*, *Lophopetalum wightianum*, *Machilus macarantha*, *Cinnamomum spp*, *Mangifera indica*, *Artocarpus hirsuta*, *Holigarna arnotiana*, *Glorea superba*, *Ixora* and *Jatropha curcas* bushes etc.

## Fauna

**Mammals:** Indian five striped squirrel, Porcupine, Fox, common Mongoose, Indian Hare. Flying Fox were observed during primary survey. Dialogue with local villagers located within the study area fox found in study area, but no wild mammalian species was directly sighted during the field survey.

**Avifauna** The bird population of study area is rich and diverse. The birds observed during primary data collection survey were *Milvus migrans* (Black Kite), *Haliaeetus leucorhynchus* (Brahminy kite) *Nycticorax nycticorax* (Night Heron), *Vanellus indicus* (Red-wattled lapwings), *Euploea core* (Common Crow), *Phalacrocorax axauritus* (Cormorant) etc.

In order to mitigate the impact of the project on the Schedule-I and endangered species found in the buffer zone, a detailed biodiversity management & Conservation plan has been prepared by NIO specifically for the Mangroves, Peacock, Indian fox, Marine turtles, Sharks and Marine mammals

## **Mangroves in Study Area**

Mangroves are present along the estuarine bank of Gurupura River having dominant species i.e *Avicennea officinalis* along with other species such as *Kandelia candel*, *Avicennea alba*, *Rhizophora mucronata*, Vegetation including mangroves in the study area along the Gurupur estuary.

## **Socio Economic**

Concerning the sex structure of the respondents, 52 percent of the respondents were males while 48 percent were females. This finding is in line with the trend of the sex structure of household heads in India, whereby males dominate.

-The average household size was found to be 5 members.

-Education is one of the keys to success and development and as such, people pay much attention to their educational status. Most of the sample respondents interviewed had some kind of formal education. Nearly 75 % of the respondents had attained education till graduation also Post Graduation, whereas 20 % of the respondents have completed SSC/HSC. 5 percent of the respondents have education till primary (Class 1-5) as the formal education.

-Availability of toilet is an important indicator of the sanitation. Public Toilet facility are available in study area. Many local respondents were aware of the project, which reflects that the project proponent has carried out regular consultation with the local resident and fisherman. All respondents are in support of the project fully. Their only demand is to give the preference to local people for working labour, labour contractors, transporters and raw material suppliers etc. in construction phase and job opportunity in operation phase.

## **4. ANTICIPATED IMPACT AND MITIGATION**

### **Impacts on Land Environment**

Impact to Land resources is one of the most potential impacts due to the construction and operation of the port project, development of ancillary sites.

### **Potential Impact due to Port Location, Land Acquisition and Changes in Land Use**

The proposed project includes construction an addition multi-purpose berth within the existing port to cater to the displaced cargo due to planned changes at other berths. The proposed project



activities are planned within existing port area; hence no land acquisition is required. Construction related activities such as clearing the site, excavation, the generation of construction waste etc. affect the land environment directly.

Clearing the site and excavation coupled with removal of vegetation triggers soil erosion and loss of top soil. Soil erosion can in turn trigger an increase in the turbidity levels in the coastal water. Hence, no major impacts are anticipated.

### **Contamination of the Soil**

#### *(a) Pre-construction phase*

Soil contamination may take place due to movement of vehicles or solid wastes generated from the labour camp set up during pre-construction stage

#### *(b) Construction Phase*

It is also important to assess the quality of dredge material for heavy material, pesticide and oil contamination as this material will be used for filling port area on land. This contamination is likely to be carried over to water bodies in case of dumping being done near water body.

#### *(c) Operational Phase*

Periodic dredging for maintaining the depth of the channel will be important operation phase activity. The sea bed, from where dredging is to be done, can hold heavy metals. The solid and hazardous wastes generated from ships and from port operations may contaminate land and water bodies if not disposed properly.

### **Mitigation Measures - Land and Soil**

The land use of the backup areas may not be changed and the facilities and other building will be constructed as per the existing landscape without any major cutting and filling and hence will not be impacted. During the operation phase adequate measures shall be taken to ensure that all waste generated at the site is collected and disposed as per the requirements Mangaluru City Corporation (MCC). Hazardous waste likely to be generated from proposed facilities is the wastes such as oil and grease from machinery and equipment must be disposed as per Hazardous waste (management) Rules 2016.

### **Potential Impacts on Local Infrastructure**

During construction phase, significant amount of construction material will be required, particularly quarry stone for the construction of bunds, buildings, etc. once the excavation of construction material is completed.

**Borrow Areas - impacts & mitigation measures:** NMPA and EPC (Engineering Procurement Construction) Contractor has to ensure that the sourcing of borrow material shall not lead to any potential impact to the local communities

- Borrow pits would be located along the natural drainage course and not across the natural drainage.
- Top fertile soil shall not be used for construction material.

### **Construction Workers - impacts & mitigation measures:**

There will be a requirement of about 100 to 150 work force (excluding service providers) during the construction phase (about 24 months).

As far as possible the workforce would be local hence no labour camps would be required to be set up, therefore not adding any additional stress on the local infrastructure. This would also ensure that there is no conflict with the local population. To mitigate impacts from health hazards, sanitation self-sufficient infrastructure facilities must be provided.

### **Mitigation Measures during Construction Phase**

- To mitigate impacts from transportation of construction material, existing roads will be strengthened and widened if required,
- Trucks with construction material susceptible for fugitive suspension will be covered with tarpaulin covers
- Transportation management will be adopted for movement of dumpers transporting quarry stones and construction materials and traffic will be regulated

### **Discharges from Ships on Land - Potential Impacts and mitigation measures during Operation**

No discharge of wastewater/waste from the ships calling at New Mangalore port will be permitted into the port area. Facilities for discharge of waste oil will be provided at the port. The

ships will have their own sewage reception/treatment facilities on board and hence no discharge of sewage will be done at the port.

## **Water Environment**

### **Potential Impacts on Surface Water**

The preliminary assessment indicates that daily demand of water during the construction phase will be around 100 KLD. The water demand will be met by the rainwater harvesting system within the port area. Major impacts caused by such activities on surface water bodies is due to litter, Wastewater generation at construction site includes surface runoff also which may contain pollutants and traces of solvents, paints, metal compounds, etc. which may impact the groundwater and nearby surface water resources, if not managed properly.

There are a number of activities associated with construction of the proposed project, which could have impacts on surface water:

- Poor control of run-off from site activities leading to siltation and eventual blocking of drains caused by excessive sand and silt in the storm water run-off
- Pollution of surface water caused by improper handling and disposal of other types of construction site wastewater
- Water pollution may result from wastewater produced by the quarry activities and by the accidental spillage of fuel, lubricants and other chemicals used in the quarry process.

### **Potential impacts during operation phase**

Storm water and excess dust suppression water runoff from the cargo storage areas and other areas of the project facilities may contaminate marine water quality if not regulated properly and will impact the marine water quality by increase in turbidity and reduce DO levels which in turn will impact the marine life.

### **Mitigation measures – Surface Water**

- Project Water Management Plan should be developed in order to secure the project sustainable water balance and in the project region in the construction phase.
- A surface water monitoring program shall be implemented during the construction phase.

- The port already has a functional STP of 1.2 MLD capacity. All the wastewater and surface run-off must be treated before it is used for sprinkling, dust suppression and greenbelt development. This facility must be monitored and maintained regularly.

### **Potential Impacts on Groundwater**

There are a number of activities associated with construction of the proposed project, which could have an impact on groundwater, no significant impacts on groundwater environment are envisaged.

- Spillage or infiltration of oils, fuels and hydraulic fluids from plant maintenance and re-fuelling areas into the soil.
- Blockage of three present natural drains in the port area will lead to higher groundwater tables and a permanently changed drainage pattern.

### **Mitigation measures – Groundwater**

Baseline review of the existing groundwater resources and current consumption in the project region. A study should be initiated to investigate the change in hydro-geological conditions, the available aquifers and safe yield levels. A groundwater monitoring program should be implemented during the construction phase.

### **Biological Environment (Terrestrial Ecology)**

#### **Terrestrial Ecology**

#### **Impacts on Terrestrial Ecology during Construction Phase**

No threatened species were observed under the impact area. Project site is surrounded by port activities and there is a very less vegetation exists in the vicinity. Hence, no major impact on terrestrial ecology is envisaged at project site. Fugitive emission formed during the construction activity may accumulate on the leaves of the plant which may diminish photosynthesis of young plants. The noise generated during the construction activity may have some negative impact on birds in the area. However, these impacts are localized, short termed and reversible.

#### **Impacts on Terrestrial Ecology during Operation**

The proposed project would not dispose effluent or solid waste in the existing environment. In addition to the wastes, noise generation from project operation would also be minor. Hence there

will not be any major adverse impact on ecology during operation phase. Further, the proposed site is covered with open scrub vegetation but after proposed project, greenbelt area will be developed which will result in beneficial impacts on ecological layout of the project area. As per the survey close to the proposed site and in the vicinity, no endangered species or wildlife is reported.

#### **Mitigation measures:**

Care must be taken to minimize the dust formation due to construction activity viz. sprinkling of water. Noise generated by construction equipment's will be controlled through provision of mufflers in machines and implementation of other noise control measures.

#### **Socio-economic Impact**

The setting up of any kind project would undoubtedly include significant impact on socio-economic and cultural life of the people in the project area. Here, an attempt is made to visualize and discuss such tentative impacts likely to be induced by the project. The likely impacts due to project activity are described below:

#### **Positive Impacts**

- The project does not involve any displacement of inhabitants and so issues like resettlement and rehabilitation does not figure. Proposed project is within port limit.
- Proposed developmental activities will provide direct and indirect benefits to the people residing in the nearby areas.
- The project construction and operation will generate revenue for the State and Central Government by way of payment of royalty, tax and sharing of port revenue.
- Port development will attract investments into the region and thereby contribute to economic growth of Dakshina Kannada District, the State of Karnataka.

#### **Negative Impacts**

- Due to the project activity, influx of population may increase during the construction phase. This may lead to strain on infrastructure facilities in the area as well as increase in population at local level. However, this impact is only for the short duration and temporary in nature.
- The construction activity could lead to increased nuisance level from air emissions and noise due to transportation of material and equipment as well as laborers.

### **Socio Economic Environment: Mitigating Measures**

In order to mitigate the adverse impacts likely to arise in the surrounding area due to proposed project activity, it is necessary to formulate an effective mitigation plan. The suggestions are as follows:

#### **Before Commencing and During Initial Phase:**

- Information regarding the proposed development plan, community programmes etc. should be communicated to the local community in the form of display Poster, booklets and audio-visuals at project site.

#### **Construction Phase:**

- Project proponent should take appropriate steps to keep environment clean and healthy during construction phase.
- Provision of adequate drinking water, toilet and bathing facilities should be made available on project site.
- Water shall be sprinkle/spread to suppress dust during construction phase to control air pollution. Control the ship and trawler traffic, Noise Pollution and thereby avoid adverse health impact.

#### **Operation Phase:**

- The project collectively will need a pool of Boat or trawler mechanic, Driver, Fisherman, Helper, watchmen, sweepers, plumbers, fitters, solid waste collectors or any kind of job opportunity. Preference should be given to local people for all this.
- Provision of proper parking arrangement, traffic management plan for smooth flow of a vehicle also cargo ship helps to abate noise pollution due to traffic.

#### **COVID-19 Pandemic:**

- Regular cleaning i.e. microbial disinfection of labour assembly point, office, canteen, labour colony etc.
- Sanitization/ Hand wash stations.
- Temperature checkup and maintenance of log of the same at labour camp and project site.
- Regular medical check-up of all the workers and staff, First aid and essential medical services should be provided at site.

## **Air Environment**

### **Potential Impact during Construction**

#### ***Impact due to Transportation of Construction and Cargo Material***

Some of the project activities (site clearance, dredging and reclamation, construction of breakwaters, construction of port infrastructure, traffic during construction and use of heavy machinery construction of road and rail) will generate air pollutants like NO<sub>2</sub>, SO<sub>2</sub>, HC, CO, PM, VOCs, etc. This has the potential to cause temporary impacts on the air quality.

The baseline concentrations of Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>), SO<sub>2</sub>, NO<sub>2</sub> and CO are within the limits of NAAQS stipulated by MoEF/CPCB.

### **Mitigation Measures**

The following measures could mitigate the anticipated negative impacts on the ambient air quality:

- Transportation vehicles to be properly and timely maintained and serviced regularly to control the emission of air pollutants in order to maintain the emissions of NOX and SOX within the limits established by international regulations;
- All static and mobile diesel-powered plant / generator sets should be used only during power cuts;
- Use of good quality fuel and lubricants will be promoted. Moreover, low sulphur content diesel shall be used as fuel for generator sets to control emission of SO<sub>2</sub>;

### **Potential Impact due to Operation**

Operation of the port (container terminal, multi-purpose cargo, and cruise) does not include bulk or uncovered materials exported from or imported to the terminal or stored on site. The sources of air pollutants from port operations include combustion emissions from ships' propulsion and auxiliary engines and boilers, mainly consisting of sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NOX), greenhouse gases (e.g. carbon dioxide [CO<sub>2</sub>] and carbon monoxide [CO]), fine particulate matter [PM], and volatile organic compounds [VOC].

## **Mitigation Measures**

The following measures could mitigate the anticipated negative impacts on the ambient air quality during operation phase:

- Generators, machineries and vehicles are to be serviced and maintained regularly to avoid generation of dust and other air pollutants.
- Regular verification of PUC certificates of all the vehicles entering into the port area.
- Developing air quality management procedures for ship operators, such as navigation of port access areas at partial power, achieving full power only after leaving the port area, limiting the practice of blowing soot from tubes or flues on steam boilers.

### ***Impact due to Cargo Handling and Storage***

During the initial stages of operation of this new berth No.17, it will be handling only the displaced cargo from the berth No. 14. Of the dry bulk cargo handled there, it is understood that iron ore fines/concentrates, limestone, gypsum, fertilisers etc. all move directly to their respective destination and are not stored within the port. Only sand is being stored.

## **Mitigation Measures**

- Provision of adequate dust suppression measures, such as sprinklers, etc. must be made.
- Storage must be covered as far as possible.
- Workers must be provided with safety equipment and gas masks.

## **Noise Environment**

### **Impact due to Port Construction Activities**

Construction noise will result from operation of equipment including the dredger and associated tugs, piling equipment, tracked excavators, Lorries, dump trucks, and other earth-moving equipment, cranes, and generators / lighting equipment.

The noise and vibration generated by piling in water if not controlled and monitored properly, can be transmitted considerable distances through the water and therefore have the potential to impact on marine mammals. There are no marine mammals present in the port foot print area and nearby premises.



## **Mitigation Measures**

The following measures could mitigate the negative impacts caused by noise emissions:

- Noise mitigation measures shall be in place prior to the commencement of any construction work.
- All contractors and subcontractors involved in the port construction phase should comply with the relevant international noise standards;
- Activities that take place near residential or sensitive receptors to be carefully planned (restricted to daytime, taking into account weather conditions, etc.)

## **Impact due to Dredging**

It is proposed activity, the dredging is proposed up to a depth of (-) 15.10 m. Capital dredging will be carried out and the quantity is assessed to be approximately 1, 50,000 cubic meters. While dredging activities it might increase the turbidity of the marine water, generate noise from a variety of sources, the primary sources of equipment noise would include the cutter suction dredger itself, with its associated pumps and generators and the tugboats used to position the dredger.

## **Mitigation Measures**

- Where necessary, noise emissions should be minimized and controlled through the application of techniques which may include installation of sound barriers
- Optimizing dredging activity and duration to reduce the time factor

## **Impact due to Port Operation**

Impacts during operations mainly will result from the port terminal activities such as vessel loading/unloading, container handling and access road/rail traffic that will result from container traffic arriving and departing through the port business day. Another major source of noise could be the operation of various equipment.

## **Mitigation Measures**

- Transmission of noise and vibration are limited by the distance from their sources. Noise could be considerably reduced by adoption of low noise equipment or installation of

sound insulation barriers. Green belt can be a good barrier to noise as well as dust emissions.

- Proper lubrication, muffling and modernization of equipment shall be done to reduce the noise, D.G. Set with acoustic enclosure shall be provided. It is recommended that workers operating various equipment during project construction and operation phases are provided with ear plugs.

## **Solid Waste Management**

### **Potential Impact during Construction**

#### ***Construction and Other Wastes***

Construction will potentially generate the following wastes: green wastes from vegetation clearance, excess construction materials, Excavation materials; food wastes from construction personnel; site office wastes; and human waste; poor construction procedures that generate excessive wastes increase construction costs and results in disposal of otherwise valuable resources. In the study area no sanitary landfill is foreseen. Therefore, there is a moderate risk to the soil quality, surface and groundwater and marine environment.

The municipal waste generated during the project construction phase shall be of the order of only 50 to 100 kg/day.

#### ***Hazardous Materials***

Hazardous wastes (oil, chemicals, lubricants, paints, compressed gases, and varnishes, etc.) generated during the construction phase should be dealt with separately from non-hazardous waste.

### **Mitigation Measures/Solid Waste Management**

The sewage/solid waste/hazardous wastes to be treated and disposed or sold to authorised recyclers as per the MoEF guidelines.

- Proper sanitation bins to be installed in the port area for collection of sewage/solid waste/construction wastes on site.
- Solid waste generated during the construction process to be separated and recycled where possible / appropriate.

### **Potential Impact during Operation**

The amount of solid waste produced by the operational activities in the proposed port may be quite substantial. Wastes originating at the port may include inert solid waste from cargo packaging and from administrative offices, as well as hazardous or potentially hazardous waste associated with vehicle and equipment maintenance operations (e.g. used lubricating oils and engine degreasing solvents).

### **Mitigation Measures**

The port Waste Management Plan should be developed defining adequate measures for SW collection, segregation, reuse and disposal.

- Port operation activities solid waste shall be adequately collected and managed by Contractor (as one option) in accordance with the relevant Indian laws, IFC PSs and IFC EHS guidelines for Waste Management Facilities

### **5. ADDITIONAL STUDIES**

No Rehabilitation and Resettlement is involved in the proposed project. Hence no R & R study has been carried out.

### **6. PROJECT BENEFIT**

- Proximity to Major International Sea routes
- Road connectivity to 3 National Highways - 66, 75 & 169
- Rail connectivity to 3 zonal railways - Southern/South Western/Konkan
- Air connectivity through Mangalore International Airport Largest LPG handling Port in India
- Highest coffee exporting port in India
- An ISO 9001:2015, 14001:2015 & ISPS Compliant Port

### **Other Benefits**

- An opportunity to develop the area and the quality of life of people
- A great opportunity to increase the financial status of government

## **7. ENVIRONMENT MANAGEMENT PLAN**

The Environmental Management Plan [EMP] has been framed on the basis of baseline data, components of the project activities and relevant mitigation measures. While it emphasizes effectiveness of managing the recommended mitigative measures it was necessary to identify credible organizations/agencies which could be made responsible to implement them properly. Budgetary support has been made intrinsic with the management items.