EXECUTIVE SUMMARY
FOR
DEVELOPMENT OF BERTHS I TO IV (OUTER) AS CONTAINER TERMINALS INCLUDING DREDGING AND CONSTRUCTION OF BREAKWATER AT VOC PORT ON DBFOT BASIS, TUTICORIN (TAMILNADU)

SCHEDULE: 7(E) PORTS, HARBOURS, BREAKWATERS, DREDGING (Category A; as the capacity of the two container terminals is assessed to be 80 MMTPA (4 MTEUs))

PROJECT PROPONENT

வ.உ.சி துறைமுக ஆணையம்
वी.ओ.सी पत्तन प्राधिकरण
V.O.C Port Authority
Global Connect

MCPL/EMD/PORT/VOC/2022-2023/Rev01 _ MARCH-2024

ToR: File No.10/35/2023-IA.III

Baseline Period: March to May 2023

MANTEC CONSULTANTS PVT. LTD.

(QCI Accredited EIA Consultant certificate No.: NABET/EIA/23-26/RA 0305-Rev.01)

(NABET Accredited EIA Consultant, MoEF&CC and NABL approved Laboratory)

Environment Division, D-36, Sector-6, Noida-201 301, U.P, Ph. 0120-4215000, 0120-4215807 Fax. 0120-4215809,

E-mail: *environment@mantecconsultants.com*

http://www.mantecconsultants.com

EXECUTIVE SUMMARY

E.1 INTRODUCTION

V.O. Chidambaranar Port (Erstwhile Tuticorin Port) is one of the major Ports of India, located at South-Eastern coast of India at latitude of 8°45' N and longitude 78°13' E. The Port has an artificial harbour protected by two breakwaters and is connected to deep water by a dredged channel. Zone A of VOC Port has sixteen cargo berths including ten alongside berths, one oil jetty, one shallow draught berth, one coastal berth and three coal jetties including NCB-I. Zone B has only three berths, including one north coal wharf, one sheet pile wharf and one RCC jetty. V.O. Chidambaranar Port handles mainly dry bulk cargoes and containers. It also handles liquid bulk and break-bulk cargoes".

Presently, VOCPA is handling vessels up to 14.20m draught. Even after modifications in the existing infrastructure, the Port will be able to handle vessels only up to a maximum of 15.50m draught. Further, there is a scarcity of back up area in the Inner Harbour for development of container yard

Meanwhile, during the last 5 years, the container vessel size have considerably increased in terms of all three dimensions viz, length, beam & draught. Hence, in order to handle the present and future trend vessels at VOC Port, Outer Harbour development would be the sole option.

The Outer harbour is proposed to be executed in two stages with construction & mechanization of CT-1 along with Breakwater construction, Rubble Bund construction and Dredging in the basin & channel in Stage I and construction & mechanization of CT 2 in Stage II and dredging to handle 18m draught vessels in Stage III. Stage I development is proposed to be completed by 2027-28 and Stage II and Stage III by 2033-34.

As per EIA Notification, published in Gazette of India, Extraordinary Part-II, Section-3, sub- section (ii) of Ministry of Environment, Forest & Climate Change dated 14.09.2006 and subsequent amendment in December, 2009, the project falls in Activity 7(e) Ports, Harbours, breakwaters, dredging. The applicant is seeking prior EC+CRZ Clearance project as per CRZ notification 2011 and its amendments (Notification 2019).

In this regard, V.O. Chidambaranar Port Authority has engaged M/s Mantec Consultants Private Limited, Noida to conduct Environmental Impact Assessment study for V.O.C project. The purpose of EIA Study is to address the information on the nature and extent of potential environmental impacts, both negative and positive during the construction and operation phase of the proposed expansion project and related activities taking place concurrently.

E.2 PROJECT DESCRIPTION

V.O. Chidambaranar Port (Erstwhile Tuticorin Port) is one of the major Ports of India, located at South-Eastern coast of India at latitude of 8°45' N and longitude 78°13' E. The project site is located at Village–Mullakadu, District–Tuticorin, State -Tamil Nadu. The nearest village is Mullakadu. Milavattan Railway station is at approx. 15kms from the project site. Tuticorin Airport, (Vagaikulam, Tamil Nadu)

is at approx. 20kms from the project site. The site and study area falls in the survey of India. There Wildlife sanctuary & National Park are far away from the project site. The location is in Seismic Zone-III.

The Project proposal comprises of "Development of two nos of Container Terminals (CT 1 & 2) of 1000 m quay length each with Container Handling equipment like Quay cranes, Rubber Tyred Gantry Cranes, Reach stacker, Tractor trailers etc, able to handle 22,000 TEUs container vessels with a total capacity of 4.0 MTEU's (80 MMTPA/MTPA), dredging in front of proposed berths & channel to handle 16.0m draught vessels (18m draught in phase wise manner), breakwater construction and reclamation bund for reclaiming the dredged materials".

The Outer harbour is proposed to be executed in

Stage I Development:

- Construction of breakwater (5635m length approx.).
- Capital dredging in the Turning circle basin to (-)16.9m and approach channel to (-)17.4m to handle 16m draught vessels (approx. dredging quantity = 9.73 M.Cu.m).
- Construction of Rubble Bund for a length of 3200m for reclamation of dredged materials.
- Construction of Container Terminal 1 of 1000m quay length. The design of berth civil structure needs to be done to handle vessels up to 21m draught of 22,000 TEU vessels.
- Mechanization of the Container Terminal (CT1) providing container handling equipment like quay gantry cranes, RTGCs, reach stacker, tractor trailers, IT systems etc,.
- Installation of Navigational Buoys in the channel.

Stage II Development:

- Capital dredging alongside the Container Terminal 2 to (-)16.9m to handle 16m draught vessels (approx. dredging quantity = 1.23 M.Cu.m).
- Construction of Container Terminal 2 of 1000m quay length. The design of berth civil structure needs to be done to handle vessels up to 21m draught of 22,000 TEU vessels.
- Mechanization of the Container Terminal (CT2) providing container handling equipment like quay gantry cranes, RTGCs, reach stacker, tractor trailers, IT systems etc,.

Stage III Development:

- Capital dredging in the Turning circle basin to (-)18.9m and approach channel to (-)19.4m to handle 18m draught vessels in CT1 & CT 2 (approx. dredging quantity = 7.52 M.Cu.m).

The overall length of breakwater proposed in the Northern and Southern side is 5635m (approx.), overall length of Rubble Bund for reclamation of dredged materials is 3200m (approx.), the overall dredging quantity for dredging alongside the berth & Harbour basin to (-) 18.9m and approach channel to (-) 19.4m to handle 18m draught vessels is 18.48 Million cubic meter (approx.).

The overall estimate cost of the project will be around Rs.8000 Crores (approx.)

Brief Description of the Project:

1	Name of the Proponent	M/s V.O Chidambaranar Port Authority
2	Project Location	Village – Mullakadu, District- Tuticorin, State- Tamil Nadu
3	Name of the Applicant	Mr. Ravi Kumar K Chief Engineer
4	Proposed Sector	7(e) Ports, Harbours, Breakwaters, Dredging
5	Area of plant	512 Ha
6	Toposheet No.	C44S2
7	Total Capacity	Cargo handling Capacity – 80 MTPA/ MMTPA
8	Cost of Project	INR 8000 Cr
9	Total Manpower	Total – 200 no.s Construction Phase- 50 Operation Phase- 150
10	Water Required and source	Total – 79.25 KLD Construction Phase- 50 KLD Operation Phase- 29.25 KLD
11	Electricity Required and source	4 MW from TANGEDCO
12	Backup Power	1) 500 KVA - 4.27 Stack height 2) 160 KVA - 3.35 Stack height 3) 100 KVA – 3.0 Stack height 4) 250 KVA- 4.58 Stack height 5) 125 KVA -2.75 Stack height
13	Rehabilitation and Resettlement	No R & R issue is involved.

E.3 ENVIRONMENT DESCRIPTION

The baseline data was collected during the study period, for three months (March 2023 to May 2023).

Terrestrial Environment:

Baseline data were collected for assessing the ambient air quality, noise levels, surface water quality, ground water quality, soil quality, socio-economic status and ecology and biodiversity within 10 km study area.

Ambient air quality: Monitoring for gaseous and particulate parameters specified in NAAQS, 2009 was performed at 8 identified locations. The results obtained for some of the important parameters are presented below.

Pollutant	Unit	Max.	Min.	NAAQS
PM_{10}	($\mu g/m^3$)	68	44	100
$PM_{2.5}$	($\mu g/m^3$)	41	25	60
NO_2	($\mu g/m^3$)	26	12	80
SO_2	($\mu g/m^3$)	15	04	80
CO	(mg/m^3)	0.89	0.52	2

Ambient air quality of 10 km project radius satisfies National Ambient Air Quality Standard limit.

Noise level: Noise monitoring was carried out at 8 different locations to assess the existing noise level of the study area. All recorded values are within limit as per Noise Pollution (Regulation and Control) Rules, 2000.

Zone	Parameters	Unit	Snapshot of values obtained during NQ monitoring	
Silence	Leq Day	dB(A)	51.5	
	Leq Night	dB(A)	39.6	
Commercial	Leq Day	dB(A)	50	
	Leq Night	dB(A)	40	
Residential	Leq Day	dB(A)	40.9(Min)	45.5(Max)
	Leq Night	dB(A)	34.1(Min)	39.2(Max)
Industrial	Leq Day	dB(A)	54.5	
	Leq Night	dB(A)	41.2	

Water quality:

Ground water samples were collected from 8 different locations to assess the existing ground water quality of the study area.

Parameters	Units	Min.	Max.
pH	-	6.64	7.69
Hardness	mg/l.	134	288
TDS	mg/l.	201	838
Chlorides	mg/l.	34	150
Sulphate	mg/l.	14	98
Iron	mg/l.	<0.02	0.094

Surface water samples were collected at 8 different locations to assess the surface water quality in the study area.

Parameters	Units	Min.	Max.
pH	-	5.97	7.99
Hardness	mg/l.	1178	1428
TDS	mg/l.	499	40612
BOD	mg/l.	5	7
COD	mg/l.	32	38
DO	mg/l.	5.6	6.2

Soil quality: Soil quality assessment was conducted at 8 different locations to understand the existing soil characteristics.

Parameters	Units	Min.	Max.
pH	-	7.35	7.55
Nitrogen	mg/100gm	14.3	15.34
Organic matter	%	1.05	2.15

Terrestrial Ecology and Biodiversity: To understand the existing status of flora and fauna within the study area, ecological assessment has been carried out. Terrestrial ecological assessment concludes that there are no eco-sensitive areas.

As per the secondary survey total of 70 fauna species reported from study, in which 5 mammals, 43 birds, 16 butterflies, 2 amphibian, and five reptiles were recorded.

As per Indian Wildlife Protection (Amendment) Act 2022 total of 13 Schedule-I species were reported.

E.4 MARINE BIODIVERSITY STUDY

In aquatic fauna total of 38 fish from 15 families were reported from the project site. In Planktons, Total 15 species of phytoplankton and 7 species of zooplankton has been reported from the area. The major phylum for zooplankton was arthropodo followed by Chaetognatha, cinidaria and rotifera

and for phytonplankton the major class was Bacillariophyceae followed by Coscinodiscophyceae and Dinophyceae.

Proper sustainable plan will be framed and followed during construction and development activity for the construction of outer harbour to avoid / mitigate destruction of species.

E.5 IMPACTS AND MITIGATION MEASURES

The impact of the project on different component of environment has been assessed and mitigative measures have been suggested. The details are given in the EIA report.

S. No.	Particulars	Mitigation measures to be adopted
1.	Air Environment	• Monitor periodically ambient air quality at selected sites. • Emission control norms will be enforced in order to reduce the emissions during construction. • No dust emissions will be anticipated during construction activities of proposed berths. • Proper sprinkling of water during loading unloading activity as well as proper house-keeping shall be maintained so as to reduce the fugitive dust emission. • The exhaust emissions from ships/vessels shall be controlled on the ship itself by providing long stacks with air emission control option such as sea-water scrubbing and fuel substitution. • D.G. Set will be used with proper enclosures in order to reduce the impact of air emissions. • Approach roads will be covered with green belt on both the sides to avoid any air quality problems to the nearby residents. • The impact of emissions from operational vehicles and equipments will be negligible to the nearby populations due to the longer distance of human settlements from the project area.
2.	Water Environment	• Monitor periodically water quality for establishing the change of water quality, if any. • Proper construction methodologies will be adopted in order to avoid turbidity problem. • No discharge of waste water to soil and ground water body. • Care will be taken to avoid layer of suspended solids and spillage of oil and grease in the seawater during transportation as well as during shifting of girders.
3.	Noise Environment	• Monitor periodically ambient noise level at selected sites. • Minimization of use of horns near sensitive locations/ silence zones with the help of sign boards at proper places.

S. No.	Particulars	Mitigation measures to be adopted
		• During construction phase noise impact will be addressed by putting barrier tin sheets around the construction site. • Wherever required the workers will be provided with personal protective equipment such as by providing mufflers and earplugs to the persons working at the project site. • All equipment for construction shall be fitted with silencers/ mufflers. Damaged silencer to be promptly replaced by the concessionaire. • DG set: as per CPCB norms, acoustic enclosure for noise control.
4.	Turbidity and suspended solids	Periodic monitoring of soil quality at specified distance for assessing contamination by vehicular emissions. Checking the overflow of spillage from the carriageway. The use of grabs in handling bottom sediment shall also limit the impact by avoiding dispersal of suspended material in surrounding water. The background turbidity levels are usually high. The organisms in these environments have adapted themselves to the tolerate exposure to high suspended sediment concentration for a longer time. Therefore organisms are less prone to disturbance by construction activities that would increase the suspended solid content in the water column.
5.	Flora and fauna	The construction work phase would increase temporarily the water turbidity. The organisms in these environments have adapted themselves to the tolerate exposure to high turbidity for a longer time. The Benthic organisms found in the study area include commonly occurring local species that does not fall under the category of endangered species. No new or alien species are expected to be introduced during or after the completion of project construction.
6.	Solid Waste Management	• No labor camp is proposed at the site during the construction phase. • Management of solid waste will be done by proper segregation, collection, disposal during operation phase. • Solid Waste Management shall be done as per TNPCB / CPCB norms and Under no circumstances treated or untreated liquid waste will be discharged into marine water..

S. No.	Particulars	Mitigation measures to be adopted
		• The construction debris will be utilized for filling low lying areas. • Municipal solid waste will be handled as per the Municipal Solid Waste Management and handling Rules by MoEF&CC

E.6 ENVIRONMENTAL MONITORING PROGRAM

V.O.C Port believes in sustainable development in all spheres of its working, which reflects on the Port's vision and mission.

The port is committed in meeting the needs and expectations of its customers and the nation by:

- Equipping itself with state-of-the-art equipment and technology and efficient, professional and computer integrated terminal operation systems.
- Conforming to international standards and offering cost effective integrated logistics solutions.
- Ensuring security and safety of life, equipment and cargo.
- Pursuing the principles of eco-friendly sustainable development.
- Constantly upgrading the competence, awareness, skills and motivation of the port personnel for continual improvement in all efficiency parameters.

Monitoring schedules

S.No	Item	Parameters	Frequency
1.	Ambient Air quality	PM_{10}, $PM_{2.5}$, SO_2, NO_x, CO, VOC etc.	Monthly
2.	Stationary Emission from Stack	PM, SO_2, NO_x	Monthly
3.	Process emission	Fugitive (PM) and gaseous pollutant expected	Monthly
4.	Water and Wastewater	pH, Temperature, EC, Turbidity, Total Dissolved Solids, Calcium, magnesium, Total hardness, Total Alkalinity, Chlorides, Sulphates, Nitrates, DO, COD, BOD, oil and Grease, Metals expected in effluent.	Monthly
5.	Treated Sewage / Effluent	pH, BOD, COD, TSS, TDS, oil and Grease, Metals expected in effluent.	Monthly
6.	Noise	Equivalent noise level- dB (A)	Monthly
7.	Soil and Solid wastes	pH, Humidity, Texture, Organic matter, N, P, K, Sulphate, Calcium, Magnesium, C:N ratio	Quarterly

8.	Greenbelt	Number of plantation (Units), Number of Survived plants/ trees, Number of poor plants/ Trees	Ongoing- round the year
9.	Environmental Audit	As per Direction of ISO 14001	Once in a Year

E.7 ADDITIONAL STUDIES

Additional studies, such as air modelling, risk assessment and disaster management plan has been carried out and given in detail in the EIA report.

AERMOD model is used for impact prediction on emission of air pollution from bulk cargo storage.

❖ **CRZ**

As per the CRZ notification 2011, VOCPA CRZ report under processed. The entire project alignment falls under CRZ IV(A) area.

Coastal Regulation Zone for proposed widening of existing container berths:

The study area falls within Bay of Bengal adjacent to Tuticorin village and within Tuticorin village. The proposed deepening of Harbour Basin & Approach Channel to handle 15.2m draught Vessels, Construction of 6 nos. of berths and modification/ up gradation of existing berthing facilities at V.O.Chidambaranar Port, widening of port entrance and proposed reclamation within V.O.Chidambaranar Port, Tuticorin, Tamil Nadu. The proposed construction of six new berths, up gradation of existing 10 berths, dredging of harbour basin, widening of port entrance, dredging of outer approach channel and proposed 3 reclamation sites falls within Bay of Benga and reclaimed land of the Port Trust.

E.8 Project Benefits:

The following are the benefits expected to generate due to implementation of the project.

- Moving back transhipment of Indian and Indian sub-continent cargo to an Indian port is an important objective for the Government. VOC Port appears to be the most suitable location for developing such a Transhipment hub. It has the key requisites (draft, proximity to main route, gateway traffic) to attract a large share of cargo moving between Asia and Europe, Africa and East Coast of America.
- Availability of a state-of-art Container Transshipment Terminal for the exporters, importers & Traders for movement of containers in a faster mode at lower costs.
- Facilitation to attract mainline Container vessels capacities to call at VOC Port for direct shipment of Containers to destination Ports.
- Shipment of Containers through larger vessels direct to destination Ports will avoid transhipment costs & save as freight rates (Economics of Scale).
- Construction of the project works will provide business to various contractors and employment opportunity for the population.

- The project will be a catalyst to attract more investments in the vicinity and pave way for the economic development of the region.

Expected Impact of the project on Logistics efficiency

- VOC Port currently has a container handling capacity of 1.02 MTEUs, with utilization at approximately 0.8 MTEUs, equating to an 80% utilization rate. Therefore, Outer Harbour development will augment the capacity to efficiently manage to handle the Projected Gateway cargoes and Transshipment.
- The Project will decongest the Port and reduce waiting time for handling container cargoes.
- With the evolving trends in the maritime industry, dimensions of container vessels, viz. length, beam, and draught have increased considerably. Outer Harbour development will cater to this pivotal shift and to adeptly handle present and forthcoming vessels.
- The envisioned development at VOC Port plays a pivotal role in realizing the objectives outlined in Maritime India Vision 2030 (MIV-2030). It will facilitate in attracting both Indian and regional transshipment traffic, reducing revenue loss, optimizing logistics, ensuring export security, and serving as a gateway to global trade dominance.
- Private participation sector will play a major role in bringing positive aspects like Efficiency in development and operation, Cost reduction, Latest cargo handling equipments.
- The project will enable to handle deep draught vessel by virtue of that it will reduce the freight related charges and ensure the fuel economy

E.9 ENVIRONMENT MANAGEMENT PLAN

Environment Management Plan is prepared to ensure effective implementation of suggested mitigation measures. This plan includes Air quality management plan, Noise quality management plan, Water management plan, Solid and Hazardous waste management plan, Dredge spoil management plan, Green belt development plan etc.

An Environment Management Cell (EMC) will be formed, which will be responsible for implementation, supervision and monitoring of environment during construction and operation phases of the project.

Responsibilities of EMC

The responsibilities of the EMC include the following:

- Environment monitoring of the surrounding area
- Timely commissioning of pollution control equipments and facilities
- Specifications and regulations of maintenance schedules for pollution control equipments
- Ensuring that standards are maintained
- Developing the green belt

- Ensuring optimum water usage
- Carrying out the Environment Management Plan
- Organizing meetings of environment management committee and preparation of report and submission of such reports to management.

E.10 CONCLUSION

- V.O Chidambaranar Port has generated a fair amount of direct, indirect and induced employment in the region. Employment will be generated also in expansion phase. The local economy will receive a boost due to employee spending and services generated by the company.
- V.O Chidambaranar Port envisage comprehensive environmental management plan (EMP) to ensure safe and clean environment. It has a detailed Environmental Management Programme and meets all statutory requirements.
- At VOCPA, Corporate Social Responsibility (CSR) has been the cornerstone of success right from inception in the year.
- The Community Development Programme is already being done incorporating health, family welfare, education, drinking water and sanitation, empowerment of women and other marginalized groups in the vicinity of major installations.
- Authority commitment towards environment & using the latest technology, along with optimal usage of available resources will reduce the impact and makes the project viable.