



BPIPL/2025/507

10 February 2026

To  
**The Member Secretary**  
**SEIAA (Gujarat)**  
Gujarat Pollution Control Board.  
"Paryavaran Bhavan", Sector-10 A  
Gandhinagar- 382 010

**Sub: Six monthly compliance status of Environment Clearance for the 'Development of Brownfield Port at the North Side of Bhavnagar Port (New Port)**

**Ref: Environment Clearance vide letter SEIAA/GUJ/EC&CRZ/7(e)/2042/2022 dated 03<sup>rd</sup> September 2022**

Dear Sir,

With reference to the above subject, please find enclosed herewith Six-Monthly Environment Clearance's (EC) compliance status report along with monitoring report etc. for the period of June 2025 to December 2025.

The process for the execution of Concession Agreement is completed at the Gujarat Maritime Board and construction work is yet to start.

This is for your kind information and record please.

Regards,  
For **Bhavnagar Port Infrastructure Private Limited**

  
**Hitendra Solanki**  
**Executive Director-Projects**



*Encl. As above*

Copy To:

1. Additional Principal Chief Conservator of Forest, MoEF&CC, Integrated Regional Office, Gandhinagar, Gujarat
2. Member Secretary, Gujarat Pollution Control Board, Gandhinagar, Gujarat
3. Vice Chairman & Chief Executive Officer, Gujarat Maritime Board, Gandhinagar, Gujarat

**Bhavnagar Port Infrastructure Pvt. Ltd.**

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# SIX MONTHLY COMPLIANCE REPORT & PERIODIC MONITORING REPORT FOR DEVELOPMENT OF NORTH SIDE OF BHAVNAGAR PORT, GUJARAT

SECOND SIX-MONTHLY PROGRESS REPORT FOR THE YEAR 2025  
(JULY - DECEMBER 2025)



PROJECT CODE : 1007122526

FOR



BHAVNAGAR PORT

**BHAVNAGAR PORT INFRASTRUCTURE  
PRIVATE LIMITED**



**INDOMER COASTAL HYDRAULICS (P) LTD.**

(ISO 9001: 2015 CERTIFIED, QCI - NABET & NABL ACCREDITED)  
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**SIX MONTHLY COMPLIANCE REPORT & PERIODIC MONITORING  
REPORT FOR DEVELOPMENT OF NORTH SIDE OF  
BHAVNAGAR PORT, GUJARAT**

Second six-monthly progress report for the year 2025  
(July - December 2025)

PROJECT CODE: 1007122526

For



**BHAVNAGAR PORT INFRASTRUCTURE PRIVATE LIMITED**



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Client	Bhavnagar Port Infrastructure Pvt. Ltd., Bhavnagar, Gujarat.				
Project Title	Six Monthly Compliance Report and Periodic Monitoring Report of Marine Environment for Development of North Side of Bhavnagar Port, Gujarat				
Project Code	1007122526				
Abstract	<p>Bhavnagar Port Infrastructure Pvt. Ltd. (BPIPL) is developing at the north side of Bhavnagar Port, Gujarat.</p> <p>BPIPL has obtained Gujarat State SEIAA clearance vide letter no. SEIAA/GUJ/EC&amp;CRZ/7(e)/2042/2022 dt. 03.09.2022 for the development of North Side of Bhavnagar Port, Gujarat.</p> <p>According to the SEIAA clearance, BPIPL has to comply the conditions stipulated in the clearance during the operation period. BPIPL has been asked to submit six-monthly compliance report and periodic monitoring report to meet the conditions of SEIAA.</p> <p>This report forms as the Second six-monthly compliance report &amp; periodic monitoring report for the year 2025 representing the period from July to December 2025.</p>				
Document type	Controlled				
Date	Report Type	Originator	Checked by	Approved by	Approver's sign
20.1.2026	Final	Mrs. D. Rekha / Mrs. R. Ranjitha	Dr. P. Chandramohan	Dr. J. Guru Prasath	
1	Project Code	1007122526		Text pages	101
2	File Location	G:/2025 projects/ BPIPL		Tables	17
				Figures	2
				Annexures	6

### ENVIRONMENTAL TEAM

Name	Qualification
Dr. P. Chandramohan	Managing Director & EIA Co-ordinator Ph. D. (Ocean Engineering) (Former Scientist, CSIR-NIO, Goa)
Dr. J. Guru Prasath	Director Functional Area Expert -RH B.E (Marine Engineering) M.S. Ph.D. (Ocean Engineering) (Former Chief Engineer, MEO Class I)
Mr. R. C. Bragath	Director Functional Area Expert - SC M. Tech. (Coastal Management) Ph. D. (Naval Architect and Ocean Engineering)
Mr. V. Kesava Das	Associate Director Functional Area Expert - WP M. Sc. (Physical Oceanography)
Dr. P. Venkadeswaran	Senior Project Officer Functional Area Expert – EB Ph.D. (Taxonomy & Ecology) M.Sc. (Botany)
Dr. G. Idayachandiran	Senior Project Officer Functional Area Expert - EB Ph. D. (Marine Biology)
Mrs. D. Rekha	Laboratory Head M.Sc. (Chemistry) (Lead Assessor – NABL)
Dr. N. Rajesh	Senior Project Officer Ph.D. (Ocean Science & Technology)
Mr. M. Parthiban	Team Head – Environment Functional Area Expert - WP Senior Project officer M. E. (Environmental Engineering)
Dr. Bharath Balji	Project officer Ph.D. (Environmental Engineering)
Mrs. R. Ranjitha	Project Officer - Environment Diploma in Civil Engineering

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## 1. INTRODUCTION

Bhavnagar Port Infrastructure Private Limited (BPIPL) is a Private Company incorporated as a Special Purpose Vehicle on 27<sup>th</sup> November 2019 for the development and operation of port facilities on the northern side of the Bhavnagar Port. BPIPL has been formed by *Foresight Group Consortium*. The Foresight Group Consortium consists of Foresight Group, Padmanabh Mafatlal Group and Boskalis. BPIPL is classified as a non-governmental company and is registered at Registrar of Companies, Ahmedabad.

The proposed development is categorized under 7 (e) – Ports and Harbours (Category B) as per EIA Notification 2006. The proposed project includes the following:

- Compressed Natural Gas Terminal.
- Liquid cargo Terminal.
- General cargo terminal/ Multipurpose Cargo Terminal.
- RO-RO Terminal.
- Infrastructure facilities for operation of port.
- Repair and Redevelopment of tidal lock gate system.
- Dredging of Navigational Channel and harbour basin.

BPIPL has obtained the SEIAA clearances:

- SEIAA – EC & CRZ clearance vide F. No. SEIAA/GUJ/EC&CRZ/7(e)/2042/2022 dt. 03.09.2022. (**Annexure I**)

This report forms as the Second six monthly progress report for the year 2025 representing various compliances met as per the norms stipulated by SEIAA in their respective clearances and periodic monitoring report for the period from July to December 2025.

This environmental compliance/monitoring report has been prepared by Indomer Coastal Hydraulics (P) Ltd., Chennai, QCI-NABET accredited organization for Sectors 27 and Sector 33. The accreditation certificate is enclosed as **Annexure 6**.

The baseline data of the project region have been collected during December 2025 covering the second half of the monitoring period from July to December 2025.

## 2. COMPLIANCE AS PER SEIAA CLEARANCE

The SEIAA approval letter is enclosed in **Annexure 1**. The various compliances to be taken into considerations are listed below:

Sl. No.	Specific Condition	Compliance
1	M/s. Bhavnagar Port infrastructure shall carry out mangrove plantation @ 1000 Hectare area in consultation with concerned Forest Department/Gujarat Ecology Commission within three years and submit detail report periodically to this office with relevant details.	BPIPL has executed a Memorandum of Understanding with Gujarat Ecology Commission to carry out mangrove afforestation on 4 <sup>th</sup> June 2022. Proof of which is given as <b>Annexure 2</b> .
2	Monitoring of ecological sensitive areas shall be monitored on regular basis by IIT Gandhinagar. IIT Gandhinagar shall also carry out periodically monitoring for coastal and marine environment of the proposed project areas IIT, Gandhinagar shall monitor the construction phase also.	BPIPL has already approached IIT Gandhinagar for monitoring of ecological sensitive areas during Construction and operation phase. Letter to Member Secretary on initiation of mangrove afforestation and Environmental Monitoring which is given as <b>Annexure 2</b> .
3	PP shall submit the complete construction plan and adhere to that.	Noted. Currently, Pre-construction plan under progress. BPIPL will submit the construction plan after completion of Project Financial Closure.
4	PP shall submit Lease Agreement made between project proponent and GMB to this office.	Area to be leased in 3 parcels. First parcel of 16 hectares land lease executed. Remaining lease agreements will be executed after completion of acquisition process at GMB level. Lease Agreement will be submitted after completion of acquisition process at GMB Level.
5	PP shall submit final Approved CRZ map of NCSCM within one /two months period to this office.	The approved CRZ map of NCSCM is submitted. The Letter is attached as <b>Annexure 3</b> .
6	Unit shall store CNG on mobile trailer and obtain PESO permission and submit copy to this Office.	BPIPL will obtain the PESO license at the stage when detailed engineering gets completed which is under progress.
7	No external Pipeline shall be installed as per submission of Bhavnagar port wide their letter dated 1 August 2022.	BPIPL will ensure that, no external pipeline will be installed in the premises.
8	Natural gas pipeline will be provided by GSPC only after obtaining necessary permission from competent authority.	BPIPL will obtain necessary permission from competent authority at the stage when detailed engineering gets completed which is under progress.
9	PP shall create environment management cell and provide adequate fund to manage environment management cell.	BPIPL will form a separate environment management cell soon on commencement of the project.
10	PP shall not disturb any other mangroves & its buffer areas than those 52 Hectare areas proposed to be lost before the GCZMA.	BPIPL will ensure that it will not disturb any mangroves & in its buffer zone than those 52 Ha. areas proposed to be lost before the GCZMA.
11	PP shall not carry out any other activity which is not permissible in CRZ notification and comply all conditions of NOC issued by GPCB as well as GMB.	BPIPL will not carry out any other activity which is not permissible in CRZ notification and comply all conditions of NOC issued by GPCB as well as GMB.

(Contd...)

Sl. No.	Specific Condition	Compliance
12	PP shall submit duly signed and stamped report of coastal and marine environment monitoring by IIT, Gandhinagar on time-to-time basis to GCZMA and SEIAA.	The monitoring by IIT, Gandhinagar to commence after commencement of construction at site. The Site access once obtained then construction will commence. IIT Gandhinagar to commence the monitoring of the said components after commencement of construction.
13	PP shall submit the management plan of Ecological sensitive areas including biological active mudflats prepared by reputed agency within project areas to GCZMA and adhere to the plan prepared and accordingly manage the biological active mudflats.	BPIPL will prepare the Management plan of Ecological sensitive areas including biological active mudflats with the help of IIT, Gandhinagar/Indomer.
14	PP shall obtain all the approval/NOC from concerned authority/ies as deemed fit for the proposed development.	BPIPL will obtain all the approval/NOC from concerned authorities as deemed fit for the proposed development.
15	All necessary permissions from different Government Departments / agencies shall be obtained by the Project Proponent before commencing the expansion activities.	BPIPL will obtain all necessary permissions from different Government Departments / agencies before the commencement of construction work.
16	The provisions of the CRZ Notification of 2011 shall be strictly adhered to by Bhavnagar port infrastructure Pvt. Ltd. No activity in contradiction to the provisions of the CRZ Notification shall be carried out by the Bhavnagar port infrastructure Pvt. Ltd.	The provisions of the CRZ Notification of 2011 will be strictly followed by BPIPL.
17	The Environmental and CRZ clearance to the project is primarily under provisions of EIA Notification,2006 and CRZ Notification, 2011. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act Rule/regulation. The Project Proponent is under obligation to obtain approval/clearances under any other Acts/ Regulations or Statutes as applicable to the project.	Condition noted.
18	Bhavnagar port infrastructure Pvt. Ltd. shall obtain prior permission from GMB.	Noted and will be complied.
19	All the recommendations, EMP, mitigation measures, environmental protection measures and safeguards proposed in the EIA report of the project prepared by M/s. Indomer Coastal Hydraulics (P) Ltd. and commitments made during presentation before SEAC and proposed in the EIA report shall be strictly adhered to in letter and spirit by Bhavnagar port infrastructure Pvt. Ltd.	BPIPL will strictly adhere that EMP, mitigation measures, environmental protection measures and safeguards which was given in the EIA Report prepared by Indomer Coastal Hydraulics (P) Ltd.
20	Bhavnagar port infrastructure Pvt. Ltd. shall obtain all necessary permissions from different Government Departments / Agencies before commissioning their activities.	All the necessary permissions will be obtained from different Government Departments / Agencies before commissioning of our activities.

Sl. No.	Specific Condition	Compliance
21	Bhavnagar port infrastructure Pvt. Ltd. shall obtain necessary permission from the Gujarat Maritime Board for marine structure, necessary permission under The Wildlife protection Act, if required, before commencing their activities.	Noted. Before commencing of the proposed activities, BPIPL will obtain necessary permissions from Gujarat Maritime Board for marine structure under The Wildlife protection Act.
22	Bhavnagar port infrastructure Pvt. Ltd. shall ensure that there shall be no discharge of any effluent/sewage into marine environment.	BPIPL ensures that there will be no discharge of any effluent/sewage into marine environment.
23	Dredging shall be carried out as and when require as mentioned in EIA report. All conditions of the CRZ clearance to be followed in letter and spirit.	Noted. Dredging shall be carried out as and when required as mentioned in EIA report.
24	Disposal of dredged to be generated during maintenance dredging shall be done as per the recommendations of scientific study carried out by Indomer, which is part of EIA report.	Noted. Dredge disposal will be done as per the recommendations of scientific study carried out by Indomer, which is part of EIA report.
25	No groundwater shall be tapped to meet with the water requirements during the construction and/or operation phases.	BPIPL will ensure that no groundwater will be tapped during the construction and operation phase of the project.
26	Bhavnagar port infrastructure Pvt. Ltd. shall ensure that there shall be no damage to the existing mangrove patches near the site and also ensure the free flow of water to avoid damage to the mangrove (If any)	Noted. BPIPL will not create any damage to the existing mangrove patches near the site and also ensures the free flow of water to avoid damage to the mangroves.
27	Bhavnagar port infrastructure Pvt. Ltd. shall carry out Mangrove plantation as per MoU with Gujarat Ecology Commission.	BPIPL has executed a Memorandum of Understanding with Gujarat Ecology Commission to carry out mangrove afforestation on 4 <sup>th</sup> June 2022. Proof of which is given as <b>Annexure 2</b> .
28	Bhavnagar port infrastructure Pvt. Ltd. shall ensure that there shall not be any discharge of pollutants into Sea, Creek etc., which affects the marine water and marine ecology like discharge from barges, accidental spillage of oils from barges etc.	Noted. There will not be any discharge of pollutants into sea, creek etc.
29	Bhavnagar port infrastructure Pvt. Ltd. shall take up green belt development activities in propose project premises. Bhavnagar port infrastructure Pvt. Ltd. shall take up mangroves plantation to be suggested in CRZ Clearance in consultation with the Forests Department / GEER Foundation / Gujarat Ecology Commission. A comprehensive plan for this purpose has to be submitted to the Forests & Environment Department SEIAA and MoEF&CC.	BPIPL has executed a Memorandum of Understanding with Gujarat Ecology Commission to carry out mangrove afforestation on 4 <sup>th</sup> June 2022. Proof of which is given as <b>Annexure 2</b> .
30	Detailed traffic control management plan shall be prepared, and its recommendations shall be strictly followed / adhered to in order to reduce adverse impacts and to avoid problems to fishermen.	Noted and will be complied if any fishing activities around the proposed project site.

Sl. No.	Specific Condition	Compliance
31	There shall be no use of any Hazardous chemicals within Jetty area.	There will not be any usage of Hazardous chemicals within Jetty area.
<b>Construction Phase</b>		
32	No construction debris and / or any other type of waste / wastewater shall be disposed of in CRZ areas	Noted. No construction debris and / or any other type of waste / wastewater will be disposed of in CRZ areas.
33	Construction materials and debris shall be properly stored and handled to avoid negative impacts such as air pollution and public nuisances by blocking the roads and public passages. The debris shall be removed from the construction site immediately after the construction is over.	Noted. Construction materials and debris will be properly stored and handled.
34	It shall be ensured that there is no adverse impact on the drainage of the area due to the construction activities.	Noted. Will ensure that there is no adverse impact on the drainage of the area due to the construction activities.
35	Solid waste likely to be generated from construction site and labour camps during construction phase will be collected and disposed off as per the Solid Waste Management Rules - 2016.	Noted. the generated Solid waste will be collected and disposed to an authorized recycler as per the Solid Waste Management Rules – 2016.
36	Vessels/ barges operating during construction phase shall be equipped with spill response kits.	Noted. BPIPL will ensure that all the vessels/ barges will be equipped with spill response kits.
37	The construction camps shall be kept outside the CRZ areas, and the construction labour shall be provided with adequate amenities like drinking water, fuel, sanitation, etc. to ensure that the existing environmental condition is not deteriorated by them.	Noted. Construction camps will be kept outside the CRZ areas with all the basic amenities.
38	Topsoil excavated during construction activities shall be stored for use in horticultural / landscape development within the project site.	Noted. Topsoil excavated during construction activities shall be stored for use in horticultural / landscape development within the project site.
39	Ready Mix Concrete should be used so far as possible Water demand during construction should be reduced by use of curing agents, plasticizers, and other best practices.	Noted. Condition will be strictly followed during construction phase.
40	The Diesel Generator Set, if to be provided during the construction phase shall be of enclosed type and conforming to the EPA Rules for air and noise emission standards.	Noted. The DG sets will be provided during the construction phase and ensure to maintain the emission standards as per CPCB.

Sl. No.	Specific Condition	Compliance
41	The overall noise level in and around the jetty area shall be kept well within the standards by providing noise control measures including engineering controls on all sources of noise generation. The ambient noise Level shall conform to the standards prescribed under The Environment (Protection) Act, 1986 & Rules.	Noted. condition will be strictly adhered.
42	Vehicles hired for bringing construction material at site should be in good conditions and conform to applicable air and noise emission standards and should be operated only during non-peak hours.	Noted. Vehicles hired for bringing construction material at site will be in good condition.
43	Fly ash should be used as building material in the construction as per provisions of Fly Ash Notification under EPA.	Noted. Condition will be strictly followed during construction phase.
<b>Operation Phase</b>		
<b>Water</b>		
44	Total water requirement for the project shall not exceed 37.35 KLD and shall be met through municipal sources, via Narmada and through tankers & pipelines.	Noted. Water requirement will be limited to 37.35 KLD and will be met through municipal sources, via. Narmada and through tankers & pipelines.
45	No ground water shall be tapped in any case for the project requirements.	No ground water will be tapped in any case for the project requirements.
46	The water meter shall be installed, and records of monthly water consumption shall be maintained regularly.	Noted. Water meter will be installed after the construction and the water consumption details will be maintained regularly.
47	There shall be no generation of industrial wastewater.	There will be no generation of industrial wastewater in our project premises.
48	The domestic wastewater generation shall not exceed 31.74 KLD and it shall be treated in STP.	The domestic wastewater will be limited to 31.74 KLD and it will be treated in the Sewage Treatment Plant.
49	There shall be no generation of Bilge water during operation phase as submitted before SEAC.	There will be no generation of Bilge water during operation phase in our project premises and the same has been submitted before SEAC.
<b>Air</b>		
50	Adequate stack height as per prevailing norms shall be provided for the flue gas emissions and flue gas emission shall conform to the norms prescribed by the GPCB at the stack outlet.	Noted. Adequate stack height will be provided in the flue gas emission area as the norms prescribed by the GPCB.
51	Diesel to the tune of 12.54 Kl/day shall be used as a fuel in Four DG Set (2500, 630 630,280 KVA) and adequate stack height shall be provided as per the CPCB norms Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution and conforming to the EPA Rules for air and noise emission standards.	Noted. Condition will be complied.
52	Adequate measures shall be taken to avoid Odour nuisance.	Noted. Control measures will be taken to avoid Odour nuisance.

Sl. No.	Specific Condition	Compliance												
53	<p>The fugitive emission in the work zone environment shall be monitored. The emission shall conform to the standards prescribed by the concerned authorities from time to time (e.g Directors of industrial Safety &amp; Health) Following indicative guidelines shall also be followed to reduce the fugitive emission.</p> <ul style="list-style-type: none"> <li>✓ Internal roads shall be either concreted or asphalted or paved properly to reduce the fugitive emission during construction.</li> <li>✓ Air borne dust shall be controlled with water sprinklers at suitable locations in the jetty premises.</li> <li>✓ A green belt shall be developed all around the boundary and also along the roads to mitigate fugitive &amp; transport dust emission</li> </ul>	Noted. Fugitive emission in the work zone environment will be monitored.												
54	Regular monitoring of ground level concentration of PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>x</sub> shall be carried out in the impact zone and its records shall be maintained Ambient air quality levels shall not exceed the standards stipulated by the GPCB. If at any stage these levels are found to exceed the prescribed limits, necessary additional control measures shall be taken immediately. The location of the stations and frequency of monitoring shall be decided in consultation with the GPCB.	Noted. Regular monitoring of ground level concentration of PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>x</sub> will be done and if any deviation in the standards, necessary additional control measures will be provided immediately.												
<b>Solid/ Hazardous waste</b>														
55	<p>Bhavnagar port infrastructure Pvt. Ltd. shall strictly comply with the rules and regulations with regards to handling and disposal of Hazardous waste in accordance with the Hazardous and Other Wastes (Management and Transboundary involvement) Rules 2016, as may be amended from time to time. Authorization of the GPCB must be obtained for collection / treatment / storage / disposal of hazardous wastes &amp; other wastes.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>S. No.</th> <th>Type /Name of Hazardous Waste</th> <th>Specific Source of generation (Name of the Activity product etc.,)</th> <th>Category and Schedule as per HW Rules.</th> <th>Quantity (MT/ Ann um)</th> <th>Management of HW</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Used oil</td> <td>Machinery</td> <td>5.1</td> <td>12</td> <td>Collection, Storage, Transportation, Disposal</td> </tr> </tbody> </table>	S. No.	Type /Name of Hazardous Waste	Specific Source of generation (Name of the Activity product etc.,)	Category and Schedule as per HW Rules.	Quantity (MT/ Ann um)	Management of HW	1	Used oil	Machinery	5.1	12	Collection, Storage, Transportation, Disposal	<p>BPIPL will strictly comply with the rules and regulations with regards to handling and disposal of Hazardous waste in accordance with the Hazardous and Other Wastes (Management and Transboundary involvement) Rules 2016.</p> <p>Used spent oil generated from the machinery will be disposed of to an Authorized Recycler as per GPCB Norms.</p>
S. No.	Type /Name of Hazardous Waste	Specific Source of generation (Name of the Activity product etc.,)	Category and Schedule as per HW Rules.	Quantity (MT/ Ann um)	Management of HW									
1	Used oil	Machinery	5.1	12	Collection, Storage, Transportation, Disposal									



Sl. No.	Specific Condition	Compliance
67	Transportation of materials shall be as per the motor Vehicle Act & Rules.	Noted. Condition will be complied.
68	The project management shall ensure to comply with all the environment protection measures, risk mitigation measures and safeguards mentioned in the Disaster Management Plan (DMP).	BPIPL will comply with all the environmental protection measures, risk mitigation measures and safeguards mentioned in the Disaster Management Plan (DMP).
69	Occupational health surveillance of the workers shall be done, and its records shall be maintained Preemployment and periodical medical examination for all the workers shall be undertaken as per the prevailing norms.	Condition will be followed strictly.
70	pp shall obtain fire safety certificate / Fire No-Objection certificate (NOC) from the concern authority as per the prevailing Rules/ Gujarat Fire Prevention and Life Safety measures Act 2016	Noted and will be obtained before commencement of construction and operation work not yet commenced.
71	PP shall carry out mock drill within the premises as per the prevailing guidelines of safety and display proper evacuation plan in the manufacturing area in case of any emergency or accident.	Condition will be complied.
72	PP shall install adequate fire hydrant system within premises and separate storage of water for the same shall be ensured by PP	Noted. BPIPL will provide adequate fire hydrant system within premises and separate storage of water for the same will be ensured.
73	PP shall take all the necessary steps for control of storage hazards within premises ensuring incompatibility of storage raw material and ensure the storage keeping safe distance as per the prevailing guidelines of the concerned authority.	Noted. condition will be followed.
74	PP shall take all the necessary steps for human safety within premises to ensure that no any harm is caused to any worker employee or labour within premises	Noted. Condition will be followed.
75	Flame proof electrical fittings shall be provided in the Jetty premises, wherever applicable.	Flame proof electrical fittings will be provided in the Jetty premises.
<b>Noise</b>		
76	The overall noise level in and around the Jetty area shall be kept well within the prescribed standards by providing noise control measures including acoustic insulation, hoods, silencers, enclosures vibration dampers etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under the Environment (Protection) Act and Rules. Workplace noise levels for workers shall be as per the Factories Act and Rules.	BPIPL will maintain the noise level in and around the jetty area and will provide noise control measures including acoustic insulation, hoods, silencers, enclosures vibration dampers etc. on all sources of noise generation as the standard prescribed under The Environment (Protection) Act, 1986 & Rules.
<b>Cleaner production and waste minimization</b>		

Sl. No.	Specific Condition	Compliance
77	High pressure hose shall be used for cleaning / washing in order to reduce wastewater generation	Noted. High pressure hose shall be used for cleaning / washing in order to reduce wastewater generation.
78	The PP shall develop green belt of (7.36 ha) as submitted before SEAC Green belt shall be developed as avenue plantation with native plant species that are significant and used for the pollution abatement as per the CPCB guidelines.	Noted. Plantation will be carried out by inhouse Environmental Team soon after completion of construction.
79	Drip irrigation / low-volume, low-angle sprinkler system shall be used for the green belt development within the premises	BPIPL will use Drip irrigation / low-volume, low-angle sprinkler system for the green belt development within the premises.
<b>Other Conditions</b>		
80	All the natural flora and fauna, water courses and channels while developing the project, it should be seen that least damage are done to them and should be done under the supervision of GMB.	Noted. Condition will be followed.
81	In the event of failure of any pollution control system adopted by the unit, the unit shall be safely closed down and shall not be restarted until the desired efficiency of the control equipment has been achieved.	Noted.
82	All the recommendations, EMP, mitigation measures, environmental protection measures and safeguards proposed in the EIA report of the project prepared by M/s Indomer Coastal Hydraulics (P) Ltd. and commitments made during presentation before SEAC and proposed in the EIA report shall be strictly adhered to in letter and spirit by Bhavnagar port infrastructure Pvt. Ltd.	BPIPL will strictly adhere that EMP, mitigation measures, environmental protection measures and safeguards which was given in the EIA Report and the same will be prepared by Indomer Coastal Hydraulics (P) Ltd. and commitments made during presentation before SEAC.
83	A separate budget shall be earmarked for environmental management and socio-economic activities including the greenbelt / mangrove plantation and details thereof shall be furnished to F&ED, SEIAA as well as MoEF, Gol. The details with respect to expenditure from this budget head shall also be furnished along with compliance report.	A separate budget will be provided once the construction is over.
84	A separate environmental management cell with qualified personnel shall be created for environmental monitoring and management during construction and operational phases of the project.	A separate Environmental management cell with Qualified personnel will be appointed to create the Environmental monitoring and management during construction and operation phase.
85	The project shall be implemented in such a manner that there shall be no any hindrance to movement of fishing vessels or fishermen.	BPIPL will ensure that project will be implemented in such a manner that there will not be any hindrance to movement of fishing vessels or fishermen.
86	Bhavnagar port infrastructure Pvt. Ltd. shall bear the cost of the external agency that may be appointed by SEIAA or Forests & Environment Department [F&ED]. Gujarat for	Condition noted.

Sl. No.	Specific Condition	Compliance
	supervision / monitoring of proposed activities and the environmental impacts of the proposed activities.	
87	Bhavnagar port infrastructure Pvt. Ltd. shall regularly submit the half-yearly compliance report on the conditions stipulated in hard and soft copies to the regulatory authorities concerned, on 1st June and 1st December of each calendar year.	The half-yearly compliance report for the period of 1st June and 1st December of each calendar year will be submitted to concerned authorities. This report forms as the second half yearly compliance report for the year 2025 representing July to December 2025
88	Any other condition that may be stipulated by the SEIAA / F&ED from time to time for environmental protection / management purpose shall have to be complied with by the Bhavnagar port infrastructure Pvt. Ltd.	Condition will be complied.
89	The project authorities must strictly adhere to the stipulations made by the Gujarat Pollution Control Board (GPCB) State Government and any statutory authority.	BPIPL will strictly adhere to the stipulations made by the Gujarat Pollution Control Board (GPCB) State Government and any statutory authority.
90	No further expansion or modifications in the project likely to cause environmental impacts shall be carried out without obtaining prior Environment Clearance from the concerned authority	Condition noted.
91	The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 the Hazardous and Other Wastes (Management and Transboundary Movement) Rules 2016 and the Public Liability insurance Act, 1991 along with their amendments and rules.	Condition noted.
92	The company shall undertake socio-economic developmental / community welfare activities as per the CSR Rules 2014.	BPIPL will undertake socio-economic developmental / community welfare activities as per the CSR Rules 2014.
93	The project proponent shall carry out the entire activities like Education, infrastructure, Health and Environment proposed under Corporate Environment Responsibility (CER) and it shall be part of the Environment management Plan (EMP) as per the MoEF&CC's OM no. F No. 22-6512017-IA. III dated 30.09.2020. This shall be monitored, and the monitoring report shall be submitted to the regional office of MoEF&CC as a part of half-yearly compliance report and to the District Collector. The monitoring report shall be posted on the website of the project proponent.	BPIPL will allocate a separate budget for Education, infrastructure, Health and Environment proposed under Corporate Environment Responsibility (CER).  Each Periodic Monitoring Report will be submitted to the concerned authorities. viz., First half yearly for the period from Jan to June 2025 and second half yearly compliance report for the year 2025 representing July to December 2025.
<b>Compliance of Environment Clearance/ Reporting/ Administration/ Appeal</b>		
94	Project proponent shall inform to all the concerned authorities including Municipal	Noted. BPIPL informed to all the concerned authorities including Municipal Corporation,

Sl. No.	Specific Condition	Compliance
	Corporation, District Collector & Gujarat Maritime Board and shall also give wide publicity through advertisement in minimum two local newspapers within seven days, about the Environment Clearance order accorded.	District Collector & Gujarat Maritime Board about the Environment Clearance order accorded and also advertised in two local newspapers. Refer <b>Annexure 5</b> .
95	Project proponent shall appoint a key person in the organization who shall be responsible for compliance of above condition fully on behalf of the proponent. It will not mean that appointing a key person will exempt the project proponent from the responsibility of compliance. Any change in key person shall immediately be informed to SEIAA and all concerned authorities.	Condition accepted and noted.
96	Designated key person shall submit six monthly compliance report to SEIAA/SEAC, MOEF&CC, GPCB and Nodal Department of the Government.	<p>This second six-monthly Compliance Report for the year 2025 (July to December 2025) will be submitted to SEIAA/SEAC, MoEFCC, GPCB and Nodal Department of the Government.</p> <p>The Periodic Monitoring is being carried out twice in a year by Indomer Coastal Hydraulics (P) Ltd., the QCI-NABET accredited EIA Consultant for Sectors 27 &amp; 33. Periodic Monitoring Reports for the year 2025 will be submitted representing July to December 2025.</p>
97	The Nodal Department or any authority or officer authorized by MOEF&CC SEIAA can inspect the site of project and all the facilities, for verification of compliance of environment clearance conditions.	Condition noted and accepted.
98	In case of violation reported upon, the project proponent shall be responsible for all the legal actions as per Environment Protection Act, 1986 including SEIAA may cancel, withdraw or keep in abeyance, Environment Clearance accorded.	Condition noted and accepted.
99	Any person including the Project proponent affected by this Environment Clearance order may file appeal to Honourable National Green Tribunal. West Zone branch, Pune, preferably within a period of thirty days from the date of issue of Environment Clearance as prescribe under section 16 of National Green Tribunal Act 2010.	Condition noted and accepted.
100	All complaints and public grievance or representations may be addressed to SEIAA/SEAC in the email addresses (a) msseiaagj@gmail.com & (b) seacgujarat@gmail.com	All complaints and public grievances will be addressed to the SEIAA/SEAC through email which was given in the condition.

**3. PERIODIC MONITORING REPORT**

**PERIODIC MONITORING REPORT  
FOR DEVELOPMENT OF NORTH SIDE OF  
BHAVNAGAR PORT, GUJARAT**

**Periodic Monitoring Report  
(July - December 2025)**

**PROJECT CODE: 1007122526**

For



**BHAVNAGAR PORT INFRASTRUCTURE PRIVATE LIMITED**



**INDOMER COASTAL HYDRAULICS (P) LTD.**

(ISO 9001: 2015 CERTIFIED, QCI - NABET & NABL ACCREDITED)

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## 1. PROJECT DESCRIPTION

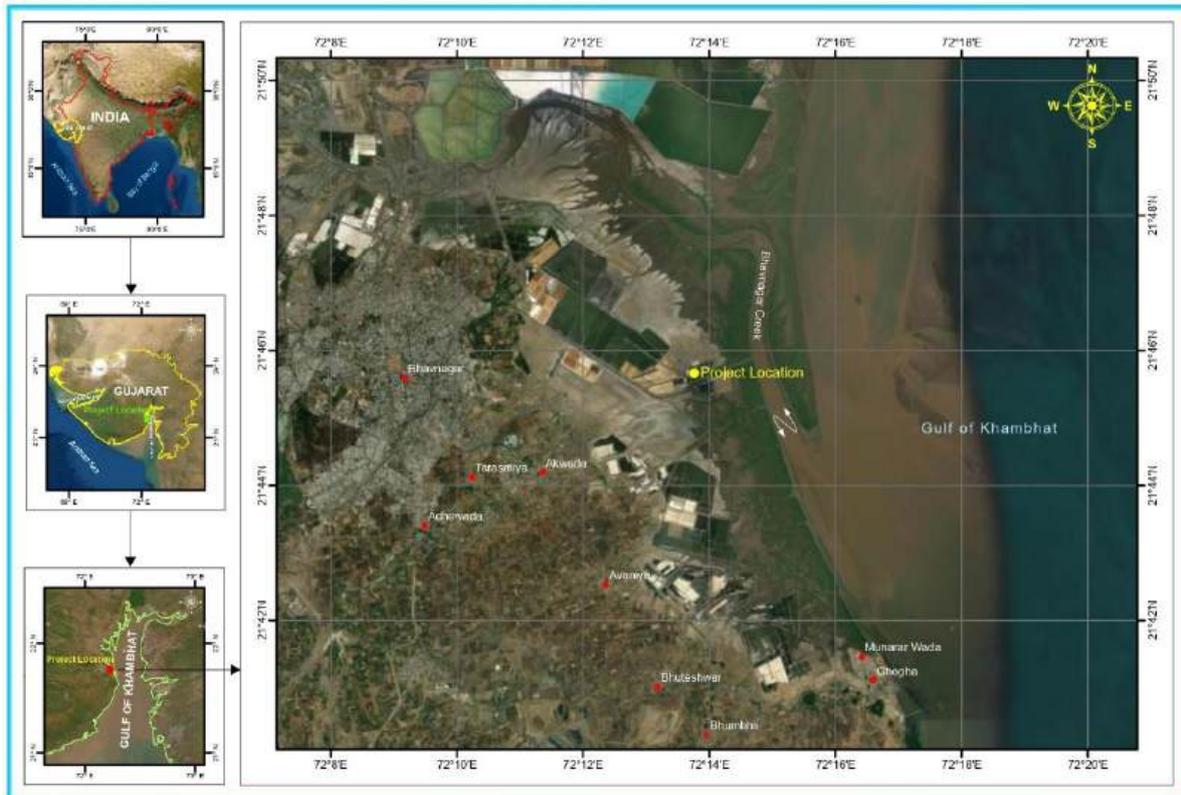
Indomer had collected the pre-project baseline data during April 2022 as part of EIA study for obtaining EC and CRZ clearances from SEIAA.

The periodic monitoring survey has to be carried out for every six months, as per SEIAA clearance. In this regard, the periodic monitoring has been carried out since May 2023 covering the six months period from January to June 2023 and the Compliance and Periodic Monitoring report is being submitted for every six months from 2023.

This report forms as the second six monthly progress report for the year 2025 presenting various compliances met as per the norms stipulated by SEIAA in their respective clearances and periodic monitoring report for the period July to December 2025.

This environmental compliance/monitoring report has been prepared by Indomer Coastal Hydraulics (P) Ltd., Chennai, the QCI-NABET accredited organization for Sectors 27 and Sector 33 and the accreditation certificate is enclosed as **Annexure 6**.

Six-monthly periodic monitoring reports are being regularly submitted to the Regional Office of SEIAA. The location map of the project region is shown in **Fig. 1**.



**Fig. 1.** Location map

## 2. SCOPE OF MONITORING

Periodic monitoring in the vicinity of the port location as suggested in the Post-Project Monitoring Plan of the EIA report was recommended by the SEIAA. Accordingly, BIPL has asked Indomer Coastal Hydraulics (P) Ltd., Chennai, to take up periodic monitoring program. It was proposed to conduct monitoring once in six months representing 'January – June' and 'July – December' every year.

Indomer Coastal Hydraulics (P) Ltd., Chennai is an ISO 9001:2015 organization, NABL and QCI - NABET accredited organization vide NABET/EIA/23-26/RA 0315 dt. 09.01.2024 for Sector 27: Oil & Gas Transportation pipeline (crude and refinery/petrochemical products), passing through national parks/ sanctuaries/ coral reefs/ ecologically sensitive areas including LNG Terminal and Sector 33: Ports, harbours, jetties, marine terminals, breakwaters and dredging.

QCI-NABET accreditation certificate is attached as **Annexure 6**.

### 3. DATA COLLECTION FOR MONITORING

The seawater, seabed sediments and biological samples were collected at four locations, i.e. stn. SS1: near port, stn. SS2: 500 m north of port, stn. SS3: 500 m south of port and stn. SS4: 750 m east of port. The details of the sampling locations are given in **Table 1** and shown in **Fig. 2**. The water samples were collected at the surface and bottom. The data collection was done in December 2025. The samples for intertidal benthos were also collected at four locations (IB1 to IB4).

**Table 1** Sampling locations

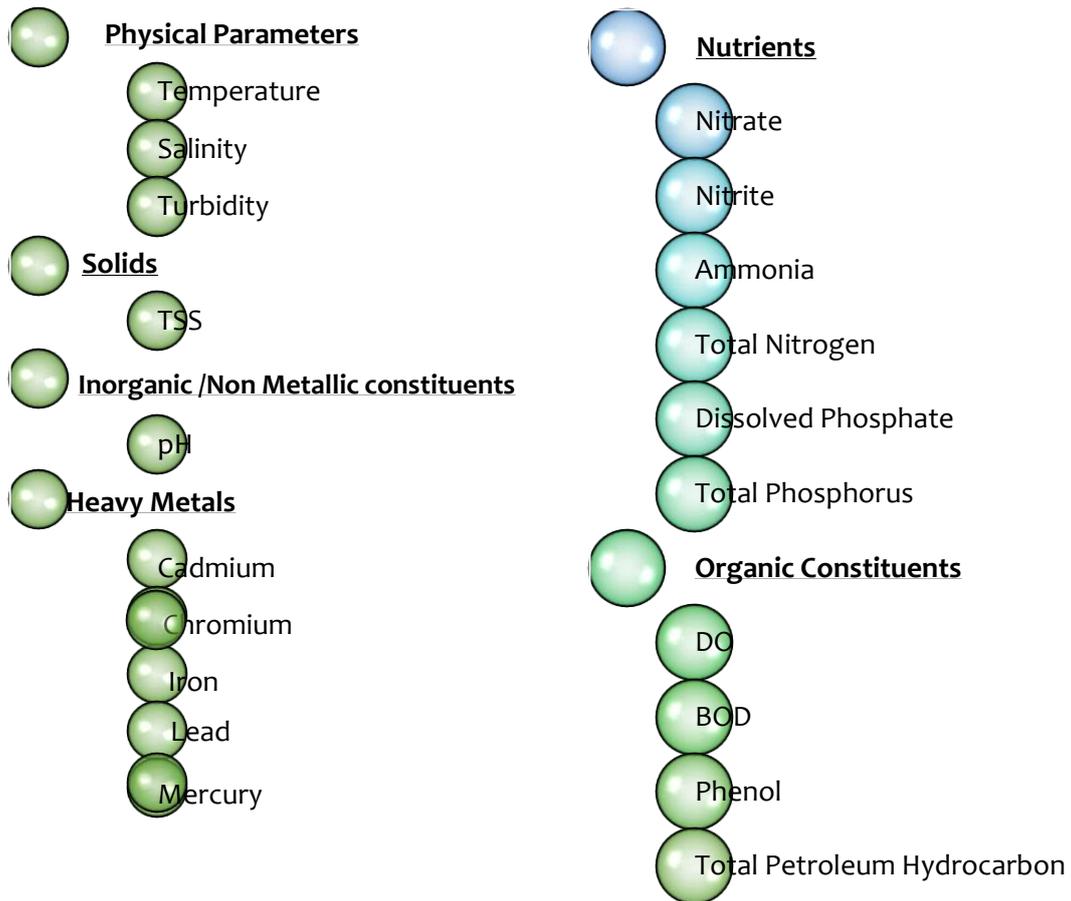
Stations	Geographical Coordinates (WGS – 84)	
	Latitude, N	Longitude, E
SS1 & SB1	21° 45'56.1"	72°14'46.0"
SS2 & SB2	21° 46'28.5"	72°14'45.4"
SS3 & SB3	21° 45'25.5"	72°14'57.9"
SS4 & SB4	21° 45'31.6"	72°15'50.4"
IB1	21° 45'40.3"	72°14'44.8"
IB2	21° 46'34.2"	72°14'38.7"
IB3	21° 45'09.8"	72°14'55.9"
IB4	21° 46'09.2"	72°14'55.2"

Note: SS: Seawater sample; SB: Seabed sediments; IB: Intertidal Benthos

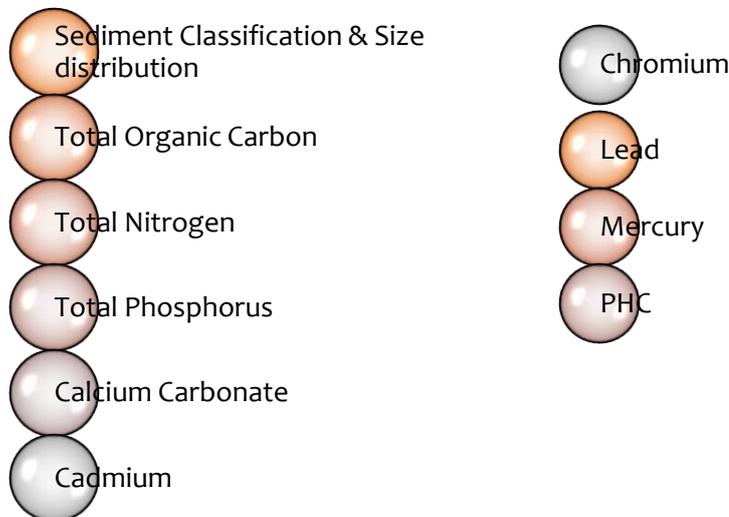


**Fig. 2.** Sampling locations

## Seawater Quality



## Sediment quality parameters



## Biological parameters

- Primary Productivity
- Phytoplankton diversity and abundance
- Zooplankton diversity, abundance and biomass
- Sub-tidal & intertidal macrobenthic diversity and abundance
- Microbial population in sea water and seabed sediment

**Analysis:** All the seawater, seabed sediment and biological parameters were analyzed by in-house laboratory of Indomer Coastal Hydraulics (P) Ltd., which is accredited by the National Accreditation Board for Testing and Calibration Laboratories (NABL). The NABL certificate is enclosed as **Annexure 6**. Analysis of Total Petroleum Hydrocarbons in seawater and sediment samples was carried out by another NABL accredited Laboratory.

**Sample Analysis Protocol:** Seawater and seabed sediment samples were analyzed as per the Indian Standard (IS); APHA and USEPA standard methods, details of which are given below:

Sl. No.	Parameters	Protocol
Water quality		
1	Temperature	IS 3025 (Part 9)
2	pH	IS 3025 (Part 11)
3	Salinity	IND/SOP/WQ/13
4	Total Dissolved Solids	IS 3025 (Part 16)
5	Dissolved Oxygen	IS 3025 (Part 38)
6	BOD	IS 3025 (Part 44)
7	COD	IND/SOP/WQ/38
8	Turbidity	IS 3025 (Part 10)
9	Ammonium	IS 3025 (Part 34)
10	Nitrite	IS 3025 (Part 34)
11	Nitrate	IS 3025 (Part 34)
12	Dissolved Phosphate	IS 3025 (Part 31)
13	Total Nitrogen	IS 3025 (Part 34)
14	Total Phosphorous	IS 3025 (Part 31)
15	Total Suspended Solids	IS 3025 (Part 17)
16	Cadmium	IS 3025 (Part 2)
17	Lead	IS 3025 (Part 2)
18	Chromium	IS 3025 (Part 2)
19	Mercury	IND/SOP/WQ/35
20	Silica	IS 3025 (Part 35)
21	Fluoride	APHA 4500-F (24th Edtn.)
22	Iron	IS 3025 (Part 2)

Continue...

Sl. No.	Parameters	Protocol
23	Strontium	IS 3025 (Part 2)
24	Zinc	IS 3025 (Part 2)
25	Sodium	IS 3025 (Part 45)
26	Potassium	IS 3025 (Part 45)
27	Total Hardness	IS 3025 (Part 21)
28	Total Alkalinity	IS 3025 (Part 23)
29	Chloride	IS 3025 (Part 32)
30	Calcium	IS 3025 (Part 40)
31	Magnesium	IS 3025 (Part 46)
32	Sulphate	IS 3025 (Part 24)
33	Petroleum Hydrocarbons	TNRCC method 1055
Sediment quality		
1	Total Organic Carbon	IS 2720 (Part 22)
2	Total Nitrogen	IS 14684
3	Total Phosphorous	IND/SOP/SQ/05
4	Calcium carbonate	IS 2720 (Part 23)
5	Cadmium	USEPA 3050 B Revision 2
6	Lead	USEPA 3050 B Revision 2
7	Chromium	USEPA 3050 B Revision 2
8	Mercury	USEPA 3050 B Revision 2
9	Petroleum Hydrocarbons	TNRCC method 1055

## Biological parameters

**Primary Productivity:** Primary production is estimated from the study area at respective sampling stations. From the water sampler, the samples are immediately transferred to 125 ml DO bottles: two light bottles and one dark bottle. The sample in the first bottle is used immediately to determine the initial level of dissolved oxygen (DO) content following Winkler method. The light and dark bottles are incubated under water for a period of 6 hours and dissolved oxygen is estimated. Primary productivity is calculated by oxygen method. Oxygen values are converted to carbon values by applying the equation.

**Phytoplankton:** Phytoplankton samples are collected from appropriate study area sampling stations, for both qualitative and quantitative analyses.

Phytoplankton samples for quantitative analyses are taken in 1 litre plastic container, from surface water and preserved with Lugol's iodine solution. The analysis of phytoplankton samples includes initial concentration of 1 L preserved water sample to 15 ml volume based on settling and siphoning procedure. Quantitative estimation of phytoplankton will be done by counting in Sedgewick-Rafter cell counter. It involved calculation of the number of cells of each species of phytoplankton in one litre of water sample.

For the qualitative analysis, phytoplankton samples are collected using circular standard plankton net (60 $\mu$  mesh and 60 cm mouth diameter). The net is towed at subsurface for 5 minutes. After the collection, samples are preserved in 4% buffered formaldehyde and examined under a compound microscope for identification, following the standard literature (R. Subrahmanyam, 1946; C.P. Gopinathan, 1976 and Tomas, 1997).

**Zooplankton:** Zooplankton samples are collected using circular zooplankton net (300  $\mu$  mesh and 60 cm mouth diameter). The samples are collected during daytime to calculate their biomass, population and biodiversity. The net is towed for 5 minutes. After the collection, samples are preserved in 5% buffered formaldehyde. The biomass value of zooplankton is calculated using the displacement volume method. The faunal composition and the relative abundance of different zooplankton taxa are sorted out and identified from aliquots upto species level as far as possible. All taxonomic observation and measurements are made on preserved samples. Specimens are identified based on the standard manuals (Kasturirangan, 1963; Conway et al. 2003). The estimated abundance (density) for the different groups is expressed as Nos. /100 m<sup>3</sup>.

**Flowmeter:** Digital Flowmeter (model - 2030R) duly calibrated by the company is used for estimating volume of flow into the net towed for 5 minutes for the collection of phytoplankton and zooplankton. The flow meter consists of an impeller and a counter. The impeller is directly connected to the counter which records each revolution of the impeller. The flow meter is attached to the mouth region of the plankton net.



**Macrobenthos:** Seabed sediment samples are collected using Van Veen grab from sampling stations. The intertidal benthic samples are collected from appropriate stations. The benthic organisms are separated by sieving through 500-micron mesh and preserved using formaldehyde and Rose Bengal stain. The samples are sorted and identified upto groups / genera level using stereomicroscope.

**Microbiology:** The microbiological samples are collected from appropriate study area sampling stations. The total coliform from each location is identified by membrane filter technique (APHA 9060 A & B). Samples are collected in clean, sterile and non-reactive glass or plastic bottles. Microbial analysis is started as soon as possible after collection to avoid unpredictable changes. Spread plate method is used to culture the microorganisms. The agar media used for analysis are: Nutrient agar, MacConkey agar, Thiosulphate Citrate Bile Sucrose agar, Xylose Lysine Deoxycholate agar, M-Enterococcus agar and Cetrimide agar. Plates are incubated at 37°C for 48 hrs. After incubation, colonies are counted and identified based on their colour characteristics.

## 4. RESULTS

### 4.1. Seawater Quality

The seawater, seabed sediment and biological samples were collected at 4 stations (stns. SS1 to SS4). The sea water samples were collected vertically across the water column, i.e., surface and bottom. The water samples were collected at surface and bottom at 4 stations (stns. SS1 to SS4). The location of seawater, seabed sediment and biological sampling stations are given in **Fig. 2**.

The seawater quality parameters viz., Temperature, pH, Salinity, Dissolved Oxygen, Turbidity, Total Suspended Solids, Biochemical Oxygen Demand, Chemical Oxygen Demand, Ammoniacal-Nitrogen, Nitrite-Nitrogen, Nitrate-Nitrogen, Total Nitrogen, Dissolved Phosphate, Total Phosphorus, are presented in **Table 2 and Table 3**. The levels of cadmium, chromium, lead, mercury, phenols and petroleum hydrocarbons are presented in **Table 4**.



Seawater sample collection

**Temperature:** The temperature variation is one of the factors in the coastal system, which may influence the physicochemical characteristics, also influence the distribution and abundance of flora and fauna. The seawater temperature values varied from 25.3 °C to 25.7 °C with an average of 25.5 °C during the study period. The temperature profile for all stations was generally stable.

**Salinity:** Salinity is an important parameter that governs the spatial distribution of marine organisms. Normally, the salinity of seawater is about 35 PSU among world oceans. Seawater salinity ranged from 32.8 to 33.5 PSU at all stations with an average of 33.1 PSU. Salinity was generally stable throughout the water column. Recorded salinity is normal for Gujarat coastal waters.

**pH:** Identifying pH for acidic or alkaline disturbances may help to locate zones of pollution and other qualifying conditions of seawater. pH ranged from 7.71 to 7.80 with an average of 7.77 during the sampling period. pH was relatively stable across all stations.

**Turbidity:** Turbidity is the measure to understand the suspended particulate matter which controls the photosynthesis in the water column. Turbidity is a measure of water clarity, which is the number of suspended materials that decrease the passage of light through the water.

Turbidity values ranged from 268 to 302 NTU with an average of 285 NTU, indicates relatively high turbidity water with a high concentration of suspended sediment, which are driven by significant tidal fluctuations and strong water currents.

**Total Suspended Solids (TSS):** Total Suspended Solids in seawater originate either from autochthonous (biological life) or allochthonous (derived from the terrestrial matter) sources; contribution from the latter can be significant in coastal waters. TSS values varied between 551 and 621 mg/l with a mean value of 586 mg/l at all sampling stations.

**Dissolved oxygen (DO):** High concentration of DO in water is an indicator of the ability of a water body to support a well-balanced aquatic life. DO in seawater is mainly replenished through photosynthesis and dissolution from the atmosphere. Simultaneously the DO is consumed during heterotrophic oxidation of organic matter and respiration by biota. In natural waters the rate of consumption of DO is lower than the rate of replenishment resulting in the maintenance of adequate concentrations which are often at the saturation level. The influx of anthropogenic discharges containing organic matter consumes DO more than that the water body can replenish creating under saturation which negatively affects biodiversity.

Dissolved oxygen concentration varies according to many factors; the main factors are due to photosynthesis and respiration by plants and animals in the water. Dissolved oxygen (DO) values ranged from 5.6 to 6.2 mg/l with an average concentration of 5.9 mg/l in the study area.

**Biochemical Oxygen Demand (BOD):** The rate of aerobic utilization of oxygen is a useful tool to evaluate the intensity of deterioration in an aquatic medium. The oxygen taken up for the breakup of organic matter leads to a reducing environment or in the event of a release of excess nutrients, it may cause eutrophication.

BOD values ranged from 1.1 to 1.6 mg/l with an average of 1.3 mg/l in the study period. The low BOD values indicate that oxidizable organic matter brought to the nearshore waters is effectively assimilated in coastal water. The range of variation in BOD values indicates that the water column is well mixed in the project area.

**Chemical Oxygen Demand (COD):** COD values ranged from 17.3 to 20.9 mg/l with an average value is 19.2 mg/l which is within the range.

**Nutrients:** Nutrients determine the potential fertility of an ecosystem and hence it is important to know their distribution and behaviour in different geographical locations and seasons. The fishery potential of an area is in turn, dependent on the availability of primary nutrients like nitrogen and phosphorus. Enrichment of these nutrients by anthropogenic inputs in the coastal waters may however result in eutrophication.

**Ammonia-Nitrogen (NH<sub>3</sub>-N):** Unpolluted waters are generally devoid of ammonia and nitrite. However, coastal input by sewage and other nitrogenous organic matter and fertilizers can increase these nutrients to higher levels. In addition, ammonia in seawater can also come from various organisms as an excretory product due to the metabolic activity and the decomposition of organic matter by micro-organisms. The mean concentration was 2.70 µmol/l, which ranged from 2.08 to 3.22 µmol/l.

**Nitrite-Nitrogen (NO<sub>2</sub>-N):** Nitrite is an important element, which occurs in seawater as an intermediate compound in the microbial reduction of nitrate or in the oxidation of ammonia. In addition, nitrite is excreted by phytoplankton especially, during plankton bloom. Nitrite varied from 0.89 to 1.39 µmol/l with an average of 1.13 µmol/l at all stations.

**Nitrate-Nitrogen (NO<sub>3</sub>-N):** Nitrate values are in general higher as compared to nitrite values. Nitrate is the final oxidation product of nitrogen compounds in seawater and is the only thermodynamically stable oxidation level of nitrogen in seawater. Nitrate is the micronutrient, which controls primary production in the euphotic surface layer. The concentration of nitrate is governed by several factors of which microbial oxidation of NH<sub>3</sub> and uptake by primary producers may be important. The mean concentration of Nitrate was 6.04 µmol/l, with ranged from 5.71 to 6.34 µmol/l during the sampling periods.

**Total Nitrogen:** Total nitrogen varied from 9.30 to 11.4 µmol/l, with an average of 10.5 µmol/l.

**Dissolved Phosphate:** Inorganic phosphate is also an important nutrient like nitrogen compound in the primary production of the sea. The concentration of phosphate, especially in the coastal waters is influenced by the river runoff and anthropogenic activity. The mean concentration of Phosphate was 1.88 µmol/l, with ranged between 1.70 and 2.09 µmol/l.

**Trace metal concentration:** Knowledge of the trace metal concentration in seawater is very important from the point of view of their possible adverse effects on marine biota. Oysters by their ability to concentrate some trace metals from the environment are considered to be useful indicators of metal pollution. Many of the trace metals are adsorbed to the particulate matter and are ultimately deposited at the bottom. The relationship between the gross concentration of heavy metal in solution and its ability to cause toxic effects in an organism is a complex one and is mostly decided by the speciation of metal and the condition of the organism. Whether or not a trace metal can interact with the biota depends on its "bioavailability" in the medium. The presence of other toxicants or metals can reduce or increase the additive toxicity of each element. In addition to these factors, temperature, pH, salinity, turbidity, and dissolved oxygen concentration also significantly affect metal-organism interactions. The nominal presences of trace metals, which occur in seawater, are found to be necessary to promote the growth of marine organisms.

**Cadmium (Cd):** The bioavailability and toxicity of trace metals such as Cd, Cu, and Zn are related to the activity of the free metal ion rather than the total metal concentration. For Cd, it is the CdCl<sub>2</sub> complex that predominates in seawater. Therefore, salinity is the overriding factor that can alter

free Cd ion activity {Cd<sup>2+</sup>}, and hence, bioavailability and toxicity in marine systems. Cadmium concentration was found to be below detectable limited (<0.1 µg/l) at all sampling stations.

**Chromium (Cr):** In natural waters, trivalent chromium is the most abundant. Chromium is a dietary requirement for a number of organisms. This however only applies to trivalent chromium. Hexavalent chromium is very toxic to flora and fauna. Chromium water pollution is not regarded as one of the major and most severe environmental problems, although discharging chromium polluted untreated wastewater in rivers has caused environmental disasters in the past. Chromium is largely bound to float particles in water. The LC<sub>50</sub> value for chromium in sea fish lies between 7 and 400 ppm, and for algae at 0.032- 6.4 ppm. However, during the study period, chromium concentration was found 0.46 µg/l to 0.53 µg/l at stn. SS1 to stn. SS4.

**Lead (Pb):** Lead has been used by man for centuries and is amongst the most widely dispersed environmental contaminant. The considerably greater toxicity of organ lead compounds compared to inorganic forms has led to studies on whether; such compounds may be formed by natural process. Available literature suggests that alkylation of lead is purely a chemical process that may occur in organic-rich anoxic sediment. The lead concentrations in the seawater samples were estimated as lead strongly gets accumulated in marine organisms especially with benthic animals like shellfish. Lead concentration was found between 1.73 µg/l and 2.55 µg/l during the study period.

**Mercury (Hg):** Mercury is considered a non-essential and toxic element for living organisms. Mercury, amongst other heavy metals, has attracted global concern due to its extensive use, toxicity, widespread distribution and biomagnifications. The bio-concentrate of mercury in aquatic organisms such as oysters and mussels has been reported to be much greater than those contained in the environment in which they live. Mercury concentration was found to be below detectable limited (<0.1 µg/l) at all sampling stations.

**Phenol:** The main source of phenolic compounds in seawater is through plants. Additionally, they can also be released during humification processes occurring in soil. Higher concentrations occur in industrial wastewaters. Phenols can be toxic to marine organisms and can accumulate in certain cellular components. During this study, the concentration of phenol in the study area was found to be <0.01 mg/l at all stations.

**Petroleum Hydrocarbons:** The coastal waters are susceptible to oil pollution due to various maritime activities like fishing operations, spillage from oil tankers, port activities etc. Hence, the petroleum hydrocarbons analysis conducted, and that concentration was found to be <0.1 µg/l at all stations during this study area.

It is evident from the results of analysis of seawater that the seawater quality is within the normal range for this region.

## 4.2. Seabed sediment quality

**Sediment size distribution:** Table 5. presents the particle size distribution of seabed sediments.

Sediment sample collection was planned at 4 stations as shown in Fig. 2. Sediment samples were collected from the seabed stations (stns.SB1 to SB4). The collected sample structure is dominated by sand and silt in nature. Results of seabed analysis are given in Table 6.



Seabed sediment collection

**Total Organic Carbon:** Total Organic carbon varied from 0.26 % to 0.31 %. The minimum was recorded at stn. SB2 while the maximum was observed at stn. SB4.

**Calcium Carbonate:** The values of calcium carbonate varied from 7.69 to 8.25 % at all sampling stations.

**Total Nitrogen:** Total nitrogen level varied from 537 to 682 mg/kg at all sampling stations.

**Total Phosphorus:** Total phosphorous concentration was varied from 35.7 to 43.2 mg/kg at all the stations. The minimum value was found at stn. SB3, while a maximum was found at stn. SB2.

### Heavy Metals

**Cadmium (Cd):** The concentration of cadmium in the study area was found between 1.08 mg/kg and 1.41 mg/kg. **Chromium (Cr):** The concentration of total chromium was found from 14.3 to 16.7 mg/kg at stn. SB1 to stn. SB4. **Lead (Pb):** The lead concentration of the study area was found to vary from 19.4 to 21.2 mg/kg at all stations. **Mercury (Hg):** The concentration of mercury was found <0.1 mg/kg at stn. SB1 to stn. SB4.

**Phenol:** Phenol was found to be below detectable level < 0.5 mg/kg i.e., at all 4 stations.

**Petroleum hydrocarbons:** Petroleum hydrocarbons were found to be below detectable level  $<0.5$  mg/kg i.e., at all 4 stations.

The parameters analysed are all found to be within the normal range of creek and Gulf region. The concentrations of heavy metals, phenols and petroleum hydrocarbons are found to be within the normal range and no contamination in seabed sediments.

### 4.3. Biological parameters

**Primary productivity:** Marine primary production plays an important role in food web dynamics, in biogeochemical cycles and in marine fisheries. The estimation of primary productivity is based on the relationship between oxygen evolution and carbon fixation. Primarily, phytoplankton depend on carbon dioxide, sunlight and nutrients for growth, but some other factors such as water depth, water temperature, wind and grazers also play a significant role. Its major components are gross and net primary production.

The primary productivity values are given in **Table 7**. Primary productivity values varied between 390 and 480 mgC/m<sup>3</sup>/day from all stations (stns. SS1 to SS4), with an average value of 435 mgC/m<sup>3</sup>/day.



Plankton sample collection

**Phytoplankton:** Phytoplankton are the most important primary producers of the sea; their productivity depends mostly on adequate supply of light and nutrients. Phytoplankton are non-evenly distributed both in space and time. The spatial and temporal abundance and composition are affected by biological, hydrographical and ecological processes. Phytoplankton form the primary source of food in the marine environment and contribute to more than 90 % of total marine primary production. Distribution of phytoplankton was investigated quantitatively and qualitatively.

**Species composition:** The phytoplankton species composition is given in **Table 8**. Totally 52 species of phytoplankton were observed, comprising three groups viz., 38 species of diatoms (Bacillariophyta), 12 species of dinoflagellates (Pyrrophyta) 1 species of Trebouxiophyceae (Chlorophyta) and 1 species of blue-green algae (Cyanophyta). The total number of phytoplankton species present varied considerably among stations. Maximum number of 44 species was observed at stn. SS2 and minimum number of 32 species was observed at stn. SS4.

**Population density:** Phytoplankton population density varied from 16,800 to 21,800 cells/l (Table 9). Maximum abundance was observed at stn. SS3, while minimum was recorded at stn. SS1. Phytoplankton population mostly consisted of Bacillariophyceae (71.77%), Dinophyceae (21.24%) Chlorophyceae (2.60) and Cyanophyceae (4.30%). *Coscinodiscus centralis* was the most dominant species followed by *Skeletonema costatum*, *Asterionella japonica*, *Nitzschia sigma*, *Chaetoceros curvisetus*, *Trichodesmium erythraeum*, *Ditylum brightwellii*, *Pleurosigma normanii* and *Dinophysis caudata*.

Using the Primer software, few ecological indices were estimated. Shannon-Wiener ( $H'$ ) diversity index (4.72-5.0) clearly showed the high productivity of the project area and can be considered as transitional zone. The similarity index in species composition and abundance among stations varied from 59.41 to 82.12% with an average similarity percentage of 67.08%. The dominance plot for all the stations showed sigma shaped curves indicating normal condition of the environment. Phytoplankton diversity indices and similarity index along with dominant plot of phytoplankton are given below.

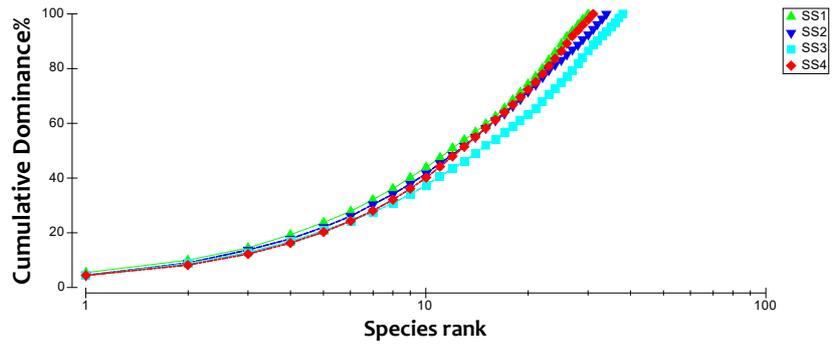
#### Phytoplankton diversity indices

Station No.	S	N	d	J'	H'(log <sub>2</sub> )	1-Lambda'
SS1	30	16800	2.98	0.962	4.72	0.958
SS2	34	18600	3.36	0.947	4.82	0.960
SS3	38	21800	3.70	0.953	5.00	0.964
SS3	31	17200	3.08	0.974	4.82	0.962

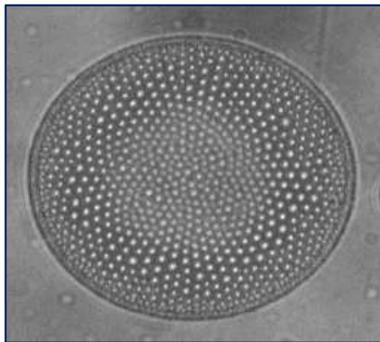
#### Similarity index of Phytoplankton

Station No.	SS1	SS2	SS3	SS4
SS1				
SS2	68.94			
SS3	62.16	67.65		
SS4	82.12	59.41	62.22	

### Dominance plot of phytoplankton



### Identified phytoplankton species



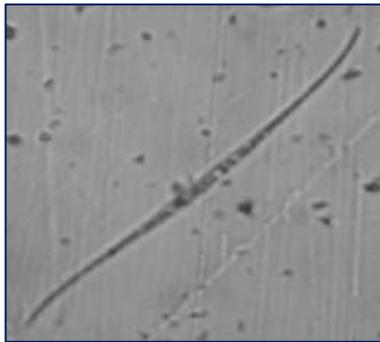
*Coscinodiscus centralis*



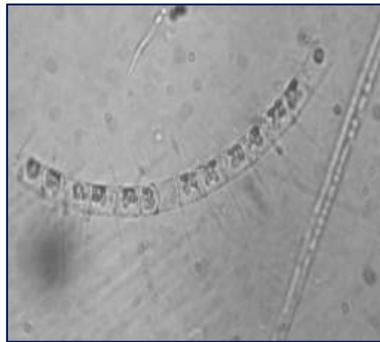
*Skeletonema costatum*



*Asterionella japonica*



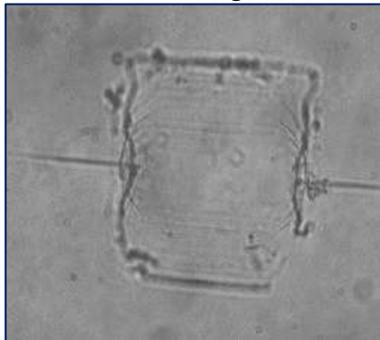
*Nitzschia sigma*



*Chaetoceros curvisetus*



*Trichodesmium erythraeum*



*Ditylum brightwellii*



*Pleurosigma normanii*



*Dinophysis caudata*

## Zooplankton

Zooplankton play a key role in marine food web dynamics and biogeochemical cycling. Spatial distribution of zooplankton is an important factor in influencing the fish stock. Hence, any decline in zooplankton population may affect ecosystem functioning. Zooplankton dynamics is largely controlled by different environmental factors. Hence, any change in ambient water quality will significantly affect zooplankton population, which in turn can affect larval survival and hence fishery. Seasonal plankton succession is a process mainly regulated by temperature and salinity conditions.

**Species composition:** Totally, 48 species of zooplankton were identified in the samples from the study area (Table 10). Copepods were the most diverse group containing the highest number of species, followed by Decapods, Ciliate groups, Urochordata, Chordata, Mollusca, Annelida and Chaetognatha. Copepods not only remained as the most dominant group but also appeared in large numbers during the sampling periods.

**Population density:** The zooplankton density ranged from 76,608 to 1,05,060 Nos./100 m<sup>3</sup> (Table 11). Highest abundance was recorded at stn. SS3, while the lowest was recorded at stn. SS1. The percentage occurrence of various groups fluctuated from station to station. The zooplankton biomass at different stations varied from 50.01 to 58.88 ml/100 m<sup>3</sup>. Most dominant species recorded in the present study were *Acartia erythraea*, *Euterpina acutifrons*, *Copilia mirabilis*, *Acartia danae*, *Calanopia minor*, *Acrocalanu s sp.*, *Microsetella rosea*, *Brachyuran zoea*, *Macrosetella gracilis* and *Oithona brevicornis*.

The Shannon-Wiener (H') diversity index (4.56 - 4.96) clearly showed the rich diversity of the project area. The similarity index in species composition and abundance among stations varied from 51.05-62.99% with an average similarity percentage of 59.09%. The dominance plot for all the stations showed sigma shaped curves indicating normal condition of the environment. Zooplankton diversity indices and similarity index along with dominance plot are given below:

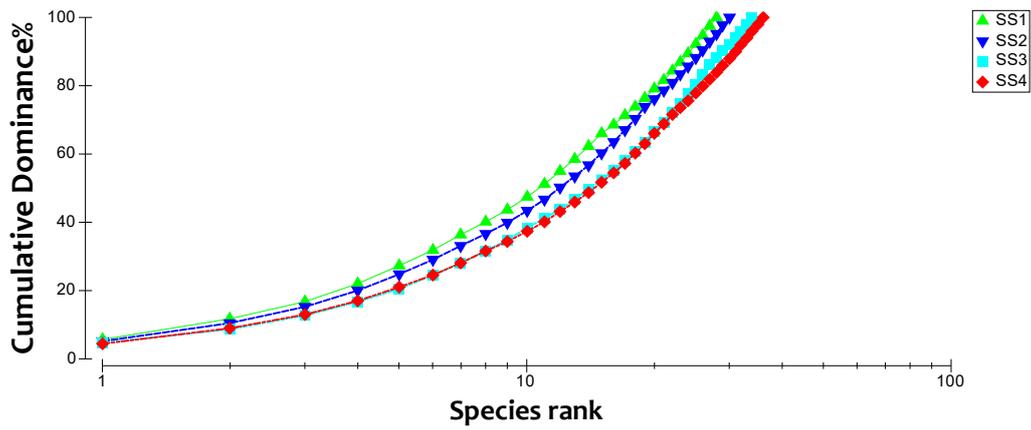
### Zooplankton diversity indices

Station	S	N	d	J'	H'(log2)	1-Lambda'
SS1	28	76608	2.401	0.9479	4.56	0.951
SS2	30	83892	2.558	0.957	4.70	0.956
SS3	34	105060	2.854	0.9691	4.93	0.964
SS4	32	97333	3.047	0.9602	4.96	0.963

### Similarity index of Zooplankton

Station No.	SS1	SS2	SS3	SS4
SS1				
SS2	61.84			
SS3	51.05	57.57		
SS4	62.99	61.76	59.32	

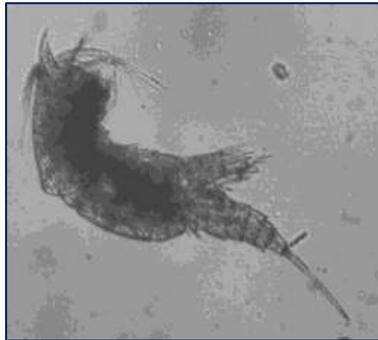
### Dominance plot of zooplankton



### Identified zooplankton species



*Acartia erythraea*



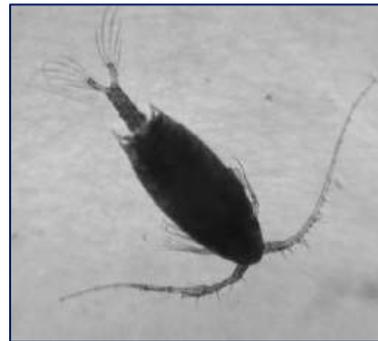
*Euterpina acutifrons*



*Copilia mirabilis*



*Acartia danae*



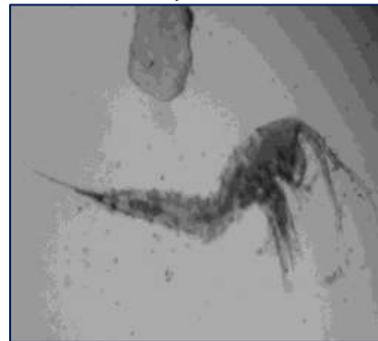
*Calanopia minor*



Polychaete larvae



*Microsetella rosea*



*Macrosetella gracilis*



*Oithona brevicornis*

## Benthos

Benthic faunal population in an environment depends on the nature and organic content of substratum. Macrobenthos in marine sediments play an important role in ecosystem processes such as mixing of sediments, flux of oxygen into sediments, nutrients cycling, dispersion and burial and secondary production. These organisms provide key linkage between primary producers and higher trophic levels.

**Subtidal benthos:** The density of subtidal macrobenthic organisms varied from 879 to 1177 Nos./m<sup>2</sup> at all stations of SB1 to SB4. Maximum abundance was observed at stn. SB2 and minimum abundance was observed at stn. SB3 (**Table 12**).

**Intertidal benthos:** The existence of intertidal fauna appeared to be moderate in the four (IB1 to IB4) locations. Numerical abundance of intertidal benthic fauna varied between 444 and 645 Nos./m<sup>2</sup>. Minimum abundance was observed at IB4 and maximum abundance was observed at IB3 (**Table 13**).

Inference: The Shannon-Wiener index H' ranged between 3.37 and 4.08 bits/individual during the study periods. Dominance index (d) was within the range between 1.73 and 2.83. Evenness index (J') fluctuated from 0.909 to 0.952. The similarity in species composition and abundance among stations varied from 51.89 – 87.19% with an average similarity percentage of 67.43%. Diversity and similarity indices along with dominance plot of macro -benthos are presented below.

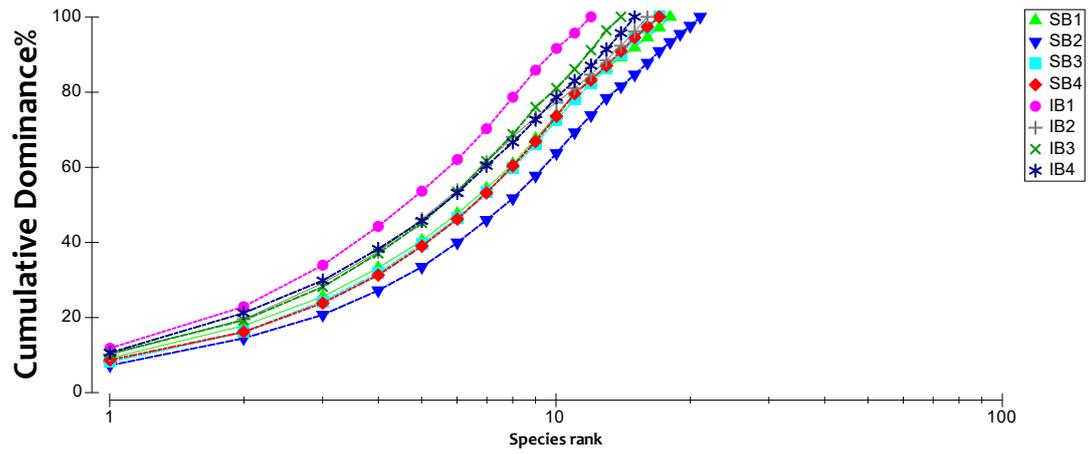
Macro-benthic organisms diversity indices

Station	S	N	d	J'	H'(log <sub>2</sub> )	1-Lambda'
SB1	18	968	2.47	0.910	3.79	0.920
SB2	21	1177	2.83	0.929	4.08	0.935
SB3	17	879	2.36	0.943	3.86	0.925
SB4	17	1001	2.32	0.939	3.84	0.925
IB 1	12	577	1.73	0.939	3.37	0.895
IB 2	16	544	2.38	0.909	3.64	0.908
IB 3	14	645	2.01	0.952	3.62	0.913
IB4	15	442	2.30	0.931	3.64	0.909

Similarity index of Macro-benthic organisms

Station No	SB1	SB2	SB3	SB4	IB 1	IB 2	IB 3	IB 4
SB1								
SB2	81.14							
SB3	77.02	79.76						
SB4	87.19	80.65	75.85					
IB 1	61.71	70.14	62.01	69.01				
IB 2	69.05	68.56	66.97	62.18	63.11			
IB 3	63.13	75.53	77.52	66.95	69.32	64.44		
IB4	56.51	59.44	55.21	61.36	58.77	51.89	53.70	

### Dominance plot of macrobenthos



### Identified macrobenthic organisms



*Cirratulus* sp.



*Pisionidens indica*



*Capitella capitata*



*Perinereis* sp.



Amphipod



Isopod

### Microbiology

Microorganism distribution in the marine and brackish environment plays an important role in the decomposition of organic matter and its mineralization. Pathogenic bacteria which cause damage to the host invade into marine environment through human and animal excreta, river runoff, land runoff, sewage, agricultural waste and industrial waste. Hence, data on spatial and temporal distribution of the total faecal coliforms as well as other pathogenic bacteria in water and sediment is essential to assess the sanitary conditions of water bodies.

**Microbial count in surface water and sediment:** Bacterial population in seawater and seabed sediment are given in **Tables 14** and **15**. In the water samples, bacterial counts varied from 0.01 to 5.42 Nos. $\times 10^3$  CFU/ml among stns. SS1 to SS4. Bacterial counts in sediment samples varied from 0.02 to 5.45 Nos. $\times 10^4$  CFU/g at all stations SB1 to SB4. The pathogenic organisms studied include total coliforms; faecal coliforms; *Escherichia coli* like organisms; *Shigella* like organisms; *Vibrio* like organisms; *Vibrio parahaemolyticus* like organisms, *Vibrio cholerae* like organisms and *Pseudomonas aeruginosa* like organisms.

Primary production, biodiversity and numerical abundance of phytoplankton, zooplankton, subtidal macrobenthos and bacteria are found to be within the normal range for the creek and Gulf region.

**Table 2** Seawater Quality Parameters

Station	Water depth	Temp. (°C)	Salinity (PSU)	pH	TSS (mg/l)	Turbidity (NTU)	Ammonia (µmol/l)	Nitrite (µmol/l)	Nitrate (µmol/l)	Total Nitrogen (µmol/l)	Dissolved Phosphate (µmol/l)	Total Phosphorus (µmol/l)
SS1	Surface	25.6	33.5	7.73	557	271	3.08	1.13	6.34	11.3	2.09	4.20
	Bottom	25.3	33.2	7.71	602	293	2.33	1.08	6	10.0	1.83	3.68
SS2	Surface	25.7	33.4	7.79	553	269	3.22	1.39	6.22	11.4	1.97	3.96
	Bottom	25.5	33.0	7.75	596	290	2.86	1.04	5.74	10.3	1.74	3.50
SS3	Surface	25.6	33.1	7.80	590	287	2.91	1.33	6.29	11.1	2.05	4.12
	Bottom	25.3	32.9	7.78	621	302	2.59	1.15	6.11	10.5	1.70	3.42
SS4	Surface	25.5	33.0	7.80	551	268	2.51	1.02	5.93	10.1	1.88	3.78
	Bottom	25.4	32.8	7.79	615	299	2.08	0.89	5.71	9.30	1.81	3.64

**Table 3** Biochemical Oxygen Demand and Chemical Oxygen Demand

Station	Water depth	DO (mg/l)	BOD (mg/l)	COD (mg/l)
SS1	S	5.9	1.6	18.7
	B	5.6	1.4	17.3
SS2	S	6.1	1.3	20.2
	B	5.8	1.1	19.5
SS3	S	6.2	1.3	20.9
	B	5.9	1.1	19.1
SS4	S	6.0	1.4	19.7
	B	5.7	1.2	18.2

**Table 4** Concentration of Heavy Metals, Phenol and Total Petroleum Hydrocarbon

Station	Cadmium as Cd (µg/l)	Chromium as Cr (µg/l)	Lead as Pb (µg/l)	Mercury as Hg (µg/l)	Phenol (mg/l)	Total Petroleum Hydrocarbons (µg/l)
SS1	<0.1	0.46	2.01	<0.1	<0.01	<0.1
SS2	<0.1	0.53	1.73	<0.1	<0.01	<0.1
SS3	<0.1	0.48	2.55	<0.1	<0.01	<0.1
SS4	<0.1	0.51	2.13	<0.1	<0.01	<0.1

**Table 5** Seabed Sediment Texture

Station	Soil Classification	D <sub>50</sub> (mm)	Sand			Silt & clay %
			Coarse %	Medium %	Fine%	
SB1	Medium sand	0.44	0.0	53.0	44.2	2.8
SB2	Fine sand	0.20	0.0	3.7	82.0	14.3
SB3	Silt & Clay	0.11	0.0	0.0	36.7	63.3
SB4	Fine sand	0.19	0.0	3.0	65.9	31.1

**Table 6** Seabed sediment quality parameters

Station	Total Organic Carbon (%)	Total Nitrogen (mg/kg)	Total Phosphorus (mg/kg)	Calcium Carbonate (%)
SB1	0.28	615	40.9	8.14
SB2	0.26	537	43.2	7.69
SB3	0.29	682	35.7	8.25
SB4	0.31	652	41.6	7.94

**Table 7** Concentration of Heavy Metals, Phenol and Total Petroleum Hydrocarbon in seabed sediments

Station	Cadmium as Cd (mg/kg)	Chromium as Cr (mg/kg)	Lead as Pb (mg/kg)	Mercury as Hg (mg/kg)	Phenol (mg/kg)	PHC (mg/kg)
SB1	1.33	15.7	19.4	<0.1	<0.5	<0.5
SB2	1.41	16.7	19.7	<0.1	<0.5	<0.5
SB3	1.12	14.3	21.2	<0.1	<0.5	<0.5
SB4	1.08	15.9	20.1	<0.1	<0.5	<0.5

**Table 8** Primary productivity – July to December 2025

Station	Gross photosynthetic activity	Net photosynthetic activity	Primary production mgC/m <sup>3</sup> /day
SS1	1.3	0.6	390
SS2	1.4	0.3	420
SS3	1.6	0.5	480
SS4	1.5	0.4	450
Average			435

**Table 9** Phytoplankton species composition\* – July to December 2025

Sl. No.	Genus / Species	Station			
		SS1	SS2	SS3	SS4
<b>Phylum: Heterokontophyta</b>					
<b>Class: Bacillariophyceae (Diatoms)</b>					
<b>Order: Centrales</b>					
1	<i>Bacteriastrum</i> sp.	+	+	+	+
2	<i>Bacteriastrum hyalinum</i>	+	-	-	+
3	<i>Bacteriastrum comosum</i>	-	+	-	+
4	<i>Chaetoceros</i> sp.	+	+	-	+
5	<i>Chaetoceros affinis</i>	+	+	+	-
6	<i>Chaetoceros curvisetus</i>	-	+	+	+
7	<i>Chaetoceros indicus</i>	+	+	+	+
8	<i>Chaetoceros decipiens</i>	+	-	+	+
9	<i>Coscinodiscus</i> sp.	-	+	+	-
10	<i>Coscinodiscus centralis</i>	+	-	+	-
11	<i>Coscinodiscus radiatus</i>	+	+	-	+
12	<i>Coscinodiscus gigas</i>	-	+	+	+
13	<i>Ditylum brightwellii</i>	-	+	+	+
14	<i>Eucampia</i> sp.	+	-	+	-
15	<i>Lauderia annulata</i>	-	+	+	+
16	<i>Leptocyclus minimus</i>	+	+	+	+
17	<i>Odontella mobiliensis</i>	-	+	+	-
18	<i>Odontella sinensis</i>	+	+	-	-
19	<i>Planktoniella sol</i>	+	-	+	+
20	<i>Rhizosolenia</i> sp.	-	+	+	-
21	<i>Rhizosolenia cylindrus</i>	-	+	+	+
22	<i>Rhizosolenia styliformis</i>	+	-	+	+
23	<i>Rhizosolenia robusta</i>	-	+	+	+
24	<i>Skeletonema costatum</i>	+	+	-	-
25	<i>Triceratium</i> sp.	-	+	+	+

(Contd.)

Sl. No.	Genus / Species	Station			
		SS1	SS2	SS3	SS4
26	<i>Triceratium reticulatum</i>	+	+	-	-
Subtotal		15	20	19	17
<b>Order: Pennales</b>					
27	<i>Asterionella japonica</i>	+	+	+	+
28	<i>Bacillaria paradoxa</i>	+	+	-	+
29	<i>Navicula</i> sp.	-	+	+	+
30	<i>Nitzschia</i> sp.	+	+	-	-
31	<i>Nitzschia longissima</i>	+	+	+	-
32	<i>Nitzschia sigma</i>	-	+	-	-
33	<i>Pleurosigma</i> sp.	+	+	+	+
34	<i>Pleurosigma directum</i>	+	+	+	+
35	<i>Pleurosigma elongatum</i>	+	-	-	-
36	<i>Pleurosigma normanii</i>	+	+	+	+
37	<i>Thalassionema frauenfeldii</i>	+	+	-	+
38	<i>Thalassionema nitzschioides</i>	-	+	+	-
Subtotal		9	11	7	7
<b>Class: Dinophyceae (Dinoflagellates)</b>					
39	<i>Ceratium macroceros</i>	-	+	-	+
40	<i>Ceratium furca</i>	+	+	+	+
41	<i>Ceratium lineatum</i>	-	+	+	+
42	<i>Ceratium longipes</i>	-	+	+	-
43	<i>Ceratium fusus</i>	+	+	+	-
44	<i>Dinophysis caudata</i>	+	+	+	+
45	<i>Noctiluca</i> sp.	+	+	+	+
46	<i>Protoperidinium</i> sp.	+	+	-	-
47	<i>Protoperidinium divergens</i>	+	+	+	-
48	<i>Protoperidinium oceanicum</i>	+	-	-	+
49	<i>Prorocentrum micans</i>	-	+	+	+
50	<i>Pyrophacus steinii</i>	+	+	+	+
Subtotal		8	11	9	8
<b>Class: Trebouxiophyceae</b>					
51	<i>Chlorella marina</i>	+	+	-	-
Subtotal		1	1	0	0
<b>Class: Cyanophyceae (Blue greens)</b>					
52	<i>Trichodesmium erythraeum</i>	+	+	+	-
Subtotal		1	1	1	0
No. of species		34	44	36	32

(-) Species absent; (+) Species present; (\*) Net sample

**Table 10** Numerical abundance of Phytoplankton\* (cells /l) – July to December 2025

Sl. No.	Genus / Species	Station				Total	%
		SS1	SS2	SS3	SS4		
<b>Phylum: Heterokontophyta</b>							
<b>Class: Bacillariophyceae (Diatoms)</b>							
<b>Order: Centrales</b>							
1	<i>Bacteriastrum</i> sp.	-	-	600	-	600	0.81
2	<i>Bacteriastrum hyalinum</i>	400	600	400	800	2200	2.96
3	<i>Bacteriastrum comosum</i>	400	-	-	400	800	1.08
4	<i>Chaetoceros</i> sp.	-	200	1200	-	1400	1.88
5	<i>Chaetoceros affinis</i>	-	400	-	-	400	0.54
6	<i>Chaetoceros curvisetus</i>	400	400	1600	800	3200	4.30
7	<i>Chaetoceros indicus</i>	600	-	-	600	1200	1.61
8	<i>Chaetoceros decipiens</i>	-	400	-	-	400	0.54
9	<i>Coscinodiscus</i> sp.	400	600	600	400	2000	2.69
10	<i>Coscinodiscus centralis</i>	1400	1000	1400	400	4200	5.65
11	<i>Coscinodiscus radiatus</i>	-	400	200	200	800	1.08
12	<i>Coscinodiscus gigas</i>	-	-	400	-	400	0.54
13	<i>Ditylum brightwellii</i>	800	200	1200	800	3000	4.03
14	<i>Eucampia</i> sp.	-	-	200	-	200	0.27
15	<i>Lauderia annulata</i>	-	-	800	-	800	1.08
16	<i>Leptocylindrus minimus</i>	200	-	-	800	1000	1.34
17	<i>Odontella mobiliensis</i>	400	200	400	400	1400	1.88
18	<i>Odontella sinensis</i>	400	-	-	400	800	1.08
19	<i>Planktoniella sol</i>	200	-	400	200	800	1.08
20	<i>Rhizosolenia</i> sp.	-	-	400	-	400	0.54
21	<i>Rhizosolenia styliformis</i>	-	600	800	-	1400	1.88
22	<i>Rhizosolenia robusta</i>	600	-	400	600	1600	2.15
23	<i>Skeletonema costatum</i>	800	1200	1000	800	3800	5.11
24	<i>Triceratium reticulatum</i>	600	400	-	600	1600	2.15
<b>Order: Pennales</b>							
25	<i>Asterionella japonica</i>	1000	1200	800	400	3400	4.57
26	<i>Bacillaria paradoxa</i>	400	1000	400	400	2200	2.96
27	<i>Navicula</i> sp.	-	200	-	-	200	0.27
28	<i>Nitzschia</i> sp.	400	-	200	400	1000	1.34
29	<i>Nitzschia sigma</i>	1000	800	600	1000	3400	4.57
30	<i>Pleurosigma</i> sp.	-	200	800	-	1000	1.34
31	<i>Pleurosigma directum</i>	400	200	400	400	1400	1.88
32	<i>Pleurosigma normanii</i>	800	1200	200	800	3000	4.03
33	<i>Thalassionema frauenfeldii</i>	400	1000	-	400	1800	2.42
34	<i>Thalassionema nitzschioides</i>	200	200	400	800	1600	2.15

(Contd.)

Sl. No.	Genus / Species	Station				Total	%
		SS1	SS2	SS3	SS4		
Percentage of class: Bacillariophyceae							71.77
<b>Class: Dinophyceae (Dinoflagellates)</b>							
35	<i>Ceratium macroceros</i>	1000	800	400	400	2600	3.49
36	<i>Ceratium furca</i>	400	800	200	-	1400	1.88
37	<i>Ceratium lineatum</i>	-	600	400	-	1000	1.34
38	<i>Ceratium longipes</i>	-	-	400	800	1200	1.61
39	<i>Ceratium fusus</i>	400	400	400	800	2000	2.69
40	<i>Dinophysis caudata</i>	800	1000	1200	-	3000	4.03
41	<i>Noctiluca sp.</i>	-	200	400	-	600	0.81
42	<i>Protoperidinium sp.</i>	-	-	200	800	1000	1.34
43	<i>Protoperidinium divergens</i>	200	200	400	200	1000	1.34
44	<i>Protoperidinium oceanicum</i>	400	200	-	-	600	0.81
45	<i>Prorocentrum micans</i>	-	200	200	-	400	0.54
46	<i>Pyrophacus steinii</i>	-	400	400	200	1000	1.34
Percentage of class: Dinophyceae							21.24
<b>Class: Trebouxiophyceae</b>							
47	<i>Chlorella marina</i>	400	400	800	400	2000	2.69
Percentage of Class: Trebouxiophyceae							2.69
<b>Class: Cyanophyceae (Blue greens)</b>							
48	<i>Trichodesmium erythraeum</i>	1000	800	600	800	3200	4.30
Percentage of class: Cyanophyceae							4.30
Population (cells/l)		16800	18600	21800	17200	74400	100
No. of species		30	34	38	31	-	-

(-) Species absent; (\*) Bottle sample

**Table 11** Numerical abundance of Zooplankton (Nos./100 m<sup>3</sup>) – July to December 2025

Sl. No.	Genus / Species	Station				Total	%
		SS1	SS2	SS3	SS4		
<b>Phylum: Protozoa</b>							
<b>Order: Tintinnids (Ciliate groups)</b>							
1	<i>Dictyocysta</i> sp.	-	-	1330	2667	3997	1.10
2	<i>Eutintinnus tenuis</i>	-	1332	2660	1333	5325	1.47
3	<i>Favella</i> sp.	5376	-	2660	-	8036	2.21
4	<i>Tintinnopsis</i> sp.	1344	-	2660	1333	5337	1.47
<b>Phylum: Cnidaria</b>							
5	<i>Phialella quadrata</i>	1344	1332	1330	2667	6673	1.84
6	<i>Diphyes</i> sp.	-	2663	-	1333	3996	1.10
<b>Phylum: Mollusca</b>							
7	Bivalve veliger	2688	-	-	1333	4021	1.11
8	Gastropod veliger	-	-	2660	2667	5327	1.47
<b>Phylum: Annelida</b>							
9	Polychaete larvae	-	-	2660	1333	3993	1.10
<b>Phylum: Arthropoda</b>							
<b>Sub-order: Cladocera</b>							
10	<i>Penilia avirostris</i>	1344	1332	1330	2667	6673	1.84
11	<i>Daphnia</i> sp.	1344	2663	-	1333	5340	1.47
<b>Class: Copepoda</b>							
<b>Order: Calanoida</b>							
12	<i>Acartia danae</i>	6720	5326	2660	2667	17373	4.79
13	<i>Acartia erythraea</i>	2688	6658	7979	5333	22658	6.24
14	<i>Acartia spinicauda</i>	1344	-	2660	2667	6671	1.84
15	<i>Acrocalanus</i> sp.	1344	6658	3989	2667	14658	4.04
16	<i>Acrocalanus gracilis</i>	-	-	2660	4000	6660	1.84
17	<i>Calocalanus pavo</i>	1344	1332	-	4000	6676	1.84
18	<i>Centropages furcatus</i>	-	2663	3989	-	6652	1.83
19	<i>Calanopia minor</i>	1344	1332	5319	6667	14662	4.04
20	<i>Eucalanus elongatus</i>	-	-	3989	-	3989	1.10
21	<i>Paracalanus parvus</i>	1344	5326	-	2667	9337	2.57
22	<i>Paracalanus</i> sp.	-	-	1330	-	1330	0.37
23	<i>Pontella</i> sp.	-	-	1330	-	1330	0.37
24	<i>Temora turbinata</i>	-	2663	2660	2667	7990	2.20
<b>Sub-order: Cyclopoida</b>							
25	<i>Copilia mirabilis</i>	2688	3995	5319	6667	18669	5.14
26	<i>Corycaeus danae</i>	2688	1332	-	2667	6687	1.84
27	<i>Corycaeus catus</i>	1344	1332	2660	-	5336	1.47
28	<i>Oithona</i> sp.	-	-	2660	-	2660	0.73
29	<i>Oithona rigida</i>	1344	2663	-	2667	6674	1.84

(Contd.)

Sl. No.	Genus / Species	Station				Total	%
		SS1	SS2	SS3	SS4		
30	<i>Oithona similis</i>	-	-	1330	-	1330	0.37
31	<i>Oithona brevicornis</i>	1344	2663	5319	-	9326	2.57
32	<i>Oncaea venusta</i>	-	2663	2660	2667	7990	2.20
<b>Sub-order: Harpacticoida</b>							
33	<i>Clytmnestra scutellata</i>	2688	2663	5319	-	10670	2.94
34	<i>Euterpina acutifrons</i>	6720	5326	3989	5333	21368	5.89
35	<i>Longipedia sp.</i>	-	2663	2660	2667	7990	2.20
36	<i>Microsetella rosea</i>	5376	2663	5319	-	13358	3.68
37	<i>Macrosetella gracilis</i>	2688	2663	-	5333	10684	2.94
38	<i>Metis jousseumei</i>	4032	-	-	2667	6699	1.85
<b>Order: Decapoda</b>							
39	Brachyuran zoea	5376	3995	2660	-	12031	3.32
40	Crustacean zoea	4032	-	-	4000	8032	2.21
41	<i>Lucifer sp.</i>	-	1332	-	-	1332	0.37
<b>Phylum: Chaetognatha</b>							
42	<i>Sagitta sp.</i>	-	1332	-	2667	3999	1.10
43	<i>Sagitta enflata</i>	-	1332	-	2667	3999	1.10
44	<i>Sagitta bipunctata</i>	2688	-	2660	-	5348	1.47
<b>Phylum: Urochordata</b>							
45	<i>Oikopleura parva</i>	2688	-	1330	2667	6685	1.84
46	<i>Oikopleura dioica</i>	-	2663	2660	-	5323	1.47
<b>Phylum: Chordata</b>							
47	Fish eggs	-	-	2660	2667	5327	1.47
48	Fish larvae	1344	1332	-	-	2676	0.74
Population (Nos./100m <sup>3</sup> )		76608	83892	105060	97337	362897	100.00
Biomass (ml/100m <sup>3</sup> )		50.01	52.57	58.88	57.09	-	-
No. of species		28	30	34	32	-	-

(-) Species absent

**Table 12** Subtidal and intertidal benthic population (Nos./m<sup>2</sup>) – July to December 2025

Sl. No.	Groups	Subtidal benthos (Nos./m <sup>2</sup> )				Intertidal benthos (Nos./m <sup>2</sup> )			
		SB1	SB2	SB3	SB4	IB1	IB2	IB3	IB4
<b>Phylum: Annelida</b>									
<b>Class: Polychaeta</b>									
1	<i>Arenicola</i> sp.	67	89	89	78	44	67	44	33
2	<i>Capitella capitata</i>	122	78	56	89	-	-	-	-
3	<i>Cirratulus</i> sp.	78	89	44	78	78	56	67	44
4	<i>Cossura</i> sp.	89	89	56	89	67	44	56	33
5	<i>Dorvillea</i> sp.	-	111	67	-	89	67	67	11
6	<i>Glycera</i> sp.	67	78	78	67	56	-	-	44
7	<i>Nephtys</i> sp.	56	78	56	56	-	33	56	22
8	<i>Nereis reducta</i>	67	67	67	67	44	56	67	-
9	<i>Perinereis</i> sp.	56	78	89	89	78	-	44	67
10	<i>Pisione indica</i>	111	89	78	111	-	-	56	22
11	<i>Pisione</i> sp.	89	44	-	89	44	44	-	67
12	<i>Prionospio cirrifera</i>	78	111	89	78	33	78	89	-
<b>Phylum: Arthropoda</b>									
13	Amphipods	22	44	11	22	22	22	11	-
14	Isopods	-	22	22	-	-	-	22	33
15	<i>Tachypleus gigas</i>	11	11	-	22	-	11	-	22
<b>Phylum: Mollusca</b>									
<b>Class: Gastropoda</b>									
16	<i>Cerithidea cingulata</i>	-	22	-	22	11	-	22	-
17	<i>Nassarius</i> sp.	-	-	11	22	-	11	-	11
18	<i>Oliva oliva</i>	11	11	22	-	-	11	22	-
19	<i>Tonna dolium</i>	11	-	-	-	-	-	-	11
20	<i>Thais bufo</i>	11	-	22	11	-	-	-	-
<b>Class: Bivalvia</b>									
21	<i>Donax cuneatus</i>	-	22	-	-	-	11	-	11
22	<i>Meretrix casta</i>	11	11	-	-	-	11	-	-
23	<i>Pholas orientalis</i>	-	22	-	11	11	-	22	11
24	<i>Solen</i> sp.	11	11	22	-	-	11	-	-
Population (Nos./m <sup>2</sup> )		968	1177	879	1001	577	544	645	444

(-) Species absent

**Table 13** Bacterial population in coastal water (Nos.x10<sup>3</sup> CFU/ml) - July to December 2025

Media	Type of Bacteria	Stations			
		SS1	SS2	SS3	SS4
Nut Agar	TVC	5.42	5.36	5.28	5.14
Mac Agar	TC	0.57	0.64	0.58	0.62
Mac Agar	FC	0.41	0.34	0.28	0.32
Mac Agar	ECLO	0.48	0.45	0.41	0.43
XLD Agar	SHLO	0.19	0.16	0.18	0.17
TCBS Agar	VLO	0.42	0.41	0.42	0.43
TCBS Agar	VPLO	0.28	0.27	0.25	0.24
TCBS Agar	VCLO	0.14	0.12	0.11	0.13
CET Agar	PALO	0.02	0.02	0.01	0.02

**Table 14** Bacterial population in seabed sediment (Nos. x10<sup>4</sup> CFU/g) - July to December 2025

Media	Type of Bacteria	Stations			
		SB1	SB2	SB3	SB4
Nut Agar	TVC	5.45	5.38	5.32	5.24
Mac Agar	TC	0.58	0.72	0.71	0.65
Mac Agar	FC	0.52	0.37	0.31	0.35
Mac Agar	ECLO	0.51	0.48	0.46	0.45
XLD Agar	SHLO	0.21	0.18	0.21	0.18
TCBS Agar	VLO	0.43	0.42	0.44	0.45
TCBS Agar	VPLO	0.31	0.28	0.27	0.26
TCBS Agar	VCLO	0.15	0.14	0.13	0.14
CET Agar	PALO	0.03	0.03	0.02	0.03

TVC-Total viable count; TC-Total Coliform; FC-Faecal Coliform; ECLO-*Escherichia coli* like organisms; SHLO-*Shigella* like organisms; VLO-*Vibrio* like organisms; VPLO-*Vibrio parahaemolyticus* like organisms; VCLO-*Vibrio cholerae* like organisms and PALO-*Pseudomonas aeruginosa* like organisms.

## Comparison with pre-project period

The present data corresponding to July to December 2025 of the seawater quality, seabed sediment quality and biological parameters were compared with pre-project data of April 2022. The comparison is given in Tables 14, 15 and 16 respectively.

### Water Quality

The seawater temperature showed a slight variation between pre-project period (April 2022) and monitoring period (July to December 2025). The turbidity and TSS of the sea water did not show much variation during both the sampling periods and it was within the normal range.

Salinity levels were also within the normal range of 32.8 – 33.5 PSU in this area. The dissolved oxygen content is found varied marginally between present study and pre-project period (April 2022). The concentrations of nitrite, nitrate, ammonia, phosphate and total nitrogen were found to have slight variations during the present study, when compared to earlier study due to seasonal variation.

The concentrations of trace metals, phenols and petroleum hydrocarbons were non-detectable during pre-project period (April 2022) and monitoring period (July to December 2025). However, marine water quality was found to be in normal range within the stipulated values indicated for coastal waters. The values recorded during present study indicates natural variability.

### Sediment quality

Sediment texture was predominantly found to be sand in nature during present study (July to December 2025) due to seasonal variation when compared to pre-project period (April 2022). The seabed sediment properties seem to be varying slightly but within normal range of coastal sediments.

### Biological Parameters

Generic diversity of phytoplankton was similar at both sampling periods with comparable values (**Table 16**). The density of phytoplankton and zooplankton are found to be well within the range in present study (July to December 2025) compared to previous study (April 2022). The sub-tidal and inter-tidal benthic and bacterial population showed marginal difference between pre-project period (April 2022) and monitoring period (July to December 2025).

Chemical and Biological parameters when compared with the present study (July to December 2025) with pre-project period (April 2022) showed no significant deviation.

**Table 15** Comparison of Seawater quality parameters between Pre-Project period (April 2022) and Monitoring period (July to December 2025)

Sl. No.	Parameters	Unit	Pre-project period	Monitoring period		Remarks
			April 2022	Jan – June 2025	July – December 2025	
			Range	Range	Range	
1	Temperature	(°C)	25.5 – 26.0	27.8 – 28.4	25.3 – 25.7	No significant change
2	pH	-	7.81 – 7.93	7.79 – 7.89	7.71 – 7.80	No significant change
3	Salinity	PSU	32.2 – 32.7	33.8 – 34.9	32.8 – 33.5	No significant change
4	Turbidity	NTU	204 - 815	253 - 298	268 – 302	Seasonal variation
5	TSS	mg/l	440 - 1790	490 - 602	551 – 621	Seasonal variation
6	DO	mg/l	5.5 – 6.0	5.7 – 5.9	5.6 – 6.2	No significant change
7	BOD	mg/l	1.0 – 1.3	1.2 – 1.4	1.1 – 1.6	Marginal variation
8	Ammonia	µmol/l	3.7 – 4.8	1.28 – 3.75	2.08 – 3.22	Seasonal variation
9	Nitrite	µmol/l	0.15 – 0.26	0.56 – 1.82	0.89 – 1.39	No significant change
10	Nitrate	µmol/l	5.7 – 6.4	5.80 – 6.25	5.71 – 6.34	No significant change
11	Total Nitrogen	µmol/l	9.8 – 11.3	10.4 – 12.8	9.30 – 11.4	–Seasonal variation
12	Dissolved Phosphate	µmol/l	1.05 – 1.46	1.23 – 2.40	1.70 – 2.09	Seasonal variation
13	Total Phosphorus	µmol/l	3.02 – 3.67	2.70 – 3.44	3.42 – 4.20	Seasonal variation
14	Cadmium	µg/l	<0.1	<0.1	<0.1	No change
15	Mercury	µg/l	<0.1	<0.1	<0.1	No change
16	Lead	µg/l	1.7 – 2.4	1.6 – 2.3	1.73 – 2.55	No significant change
17	Chromium	µg/l	0.38 – 0.44	0.43 – 0.56	0.46 – 0.53	No significant change
18	Phenols	mg/l	<0.01	<0.01	<0.01	No change
19	Total Petroleum Hydrocarbons	µg/l	<0.1	<0.1	<0.1	No change

**Table 16** Comparison of Seabed sediment quality parameters between Pre-Project period (April 2022) and Monitoring period (July to December 2025)

Sl. No.	Parameters	Unit	Pre-project period	Monitoring period		Remarks
			April 2022	Jan – June 2025	July – December 2025	
			Range	Range	Range	
1	Sediment texture	-	Silty Clay	Silty Clay	Silty Clay	No significant change
2	Total phosphorous	mg/kg	34.2 – 48.8	38.8 – 44.2	35.7 – 43.2	No significant change
3	Total nitrogen	mg/kg	326 - 484	637 – 714	537 – 682	Seasonal variation
4	Total organic carbon	%	0.52 – 0.92	0.31 – 0.41	0.26 – 0.31	Marginal variation
5	Calcium carbonate	%	14.2 – 16.8	8.2 – 9.6	7.69 – 8.25	Seasonal variation
6	Cadmium	mg/kg	1.36 - 1.52	1.24 – 1.50	1.08 – 1.41	No significant change
7	Mercury	mg/kg	<0.1	<0.1	<0.1	No change
8	Lead	mg/kg	18.6 – 20.8	20.1 – 21.5	19.4 – 21.2	Seasonal variation
9	Chromium	mg/kg	21.9 – 25.2	17.8 – 18.8	14.3 – 16.7	Seasonal variation
10	Petroleum Hydrocarbons	mg/kg	<0.5	<0.5	<0.5	No change

**Table 17** Comparison of Biological parameters between Pre-Project period (April 2022) and Monitoring period (July to December 2025)

Sl. No.	Parameters	Unit	Pre-project period	Monitoring period		Remarks
			April 2022	Jan – June 2025	July – December 2025	
<b>Phytoplankton</b>						
1	Primary Productivity	mgC/m <sup>3</sup> /day	360 – 480	390 – 480	390 – 480	No Significant Change
2	Species composition	Nos.	27 – 47	33 – 42	32 – 44	Seasonal variation
3	Abundance	Cells/l	14,900 – 25,400	17,800 – 25,600	16,800 – 21,800	Seasonal variation
<b>Zooplankton</b>						
4	Biomass	ml/100 m <sup>3</sup>	54.8 – 83.3	47.2 – 58.2	50.01 – 58.88	No significant change
5	Abundance	Nos./100 m <sup>3</sup>	77,814 – 1,01,090	78,838 – 1,07,843	76,608 – 1,05,060	Seasonal variation
<b>Benthos</b>						
6	Subtidal density	Nos./m <sup>2</sup>	640 – 960	800 – 960	879 – 1177	Seasonal variation
7	Intertidal density	Nos./m <sup>2</sup>	510 – 735	420 – 570	444 – 645	Seasonal variation
<b>Microbial count</b>						
8	Water	Nos. x10 <sup>3</sup> CFU /ml	0.01 – 5.18	0.02 – 5.46	0.01 – 5.42	No Significant change
9	Sediment	Nos. x10 <sup>4</sup> CFU/g	0.01 – 5.22	0.04 – 5.52	0.02 – 5.45	No Significant change

**Annexure - 1**

ENVIRONMENTAL  
CLEARANCE



**Government of India**  
**Ministry of Environment, Forest and Climate Change**  
**(Issued by the State Environment Impact Assessment**  
**Authority(SEIAA), Gujarat)**

To,

The DIRECTOR  
BHAVNAGAR PORT INFRASTRUCTURE PVT. LTD.  
401, 4th Floor, Building No. 637, F. P. No. 637, 638, 2nd Lane, Panchvati,  
Gulbai Tekra, Ahmedabad, Gujarat -380006

**Subject:** Grant of Environmental Clearance (EC) to the proposed Project Activity  
under the provision of EIA Notification 2006-regarding

Sir/Madam,

This is in reference to your application for Environmental Clearance (EC)  
in respect of project submitted to the SEIAA vide proposal number  
SIA/GJ/NCP/68080/2021 dated 05 May 2022. The particulars of the environmental  
clearance granted to the project are as below.

1. EC Identification No.	EC22B033GJ110702
2. File No.	SIA/GJ/82605/2022
3. Project Type	New
4. Category	B1
5. Project/Activity including Schedule No.	7(e) Ports, Harbours
6. Name of Project	Development of North-side of Bhavnagar (New) Port
7. Name of Company/Organization	BHAVNAGAR PORT INFRASTRUCTURE PVT. LTD.
8. Location of Project	Gujarat
9. TOR Date	16 Apr 2022

The project details along with terms and conditions are appended herewith from page  
no 2 onwards.

Date: 23/11/2022

(e-signed)  
Prakash K. Majmudar  
Member Secretary  
SEIAA - (Gujarat)

*Note: A valid environmental clearance shall be one that has EC identification  
number & E-Sign generated from PARIVESH. Please quote identification  
number in all future correspondence.*

*This is a computer generated cover page.*



Prakash K. Majmudar  
MEMBER SECRETARY  
SEIAA (GUJARAT)



STATE LEVEL ENVIRONMENT  
IMPACT ASSESSMENT  
AUTHORITY  
GUJARAT

No. SEIAA/GUJ/EC&CRZ/7(e)/2042/2022

Date: **03 SEP 2022** by R P A D

Time Limit

Sub: Environment & CRZ Clearance for the development of North-side of Bhavnagar (new) port by M/s. Bhavnagar Port Infrastructure Pvt. Ltd., at Darbar Bhatho - GMB port, Existing Bhavnagar Port Ltd., Bhavnagar, proposed by the Bhavnagar Port Infrastructure Pvt. Ltd. in Category 7(e) of Schedule annexed with EIA Notification dated 14/09/2006 and CRZ Notification, 2011.

Ref: Your Proposal No. SIA/GJ/NCP/68080/2021 dated 05.05.2022.

Dear Sir,

This has reference to your application along with final EIA report dated 05/05/2022 submitted to SEIAA, seeking Environmental Clearance under Environment Impact Assessment Notification, 2006 as well as application for CRZ clearance along with Form-I dated 28/04/2022 seeking CRZ clearance submitted to the Gujarat Coastal Zone Management Authority (Forests & Environment Department-F&E)D, Gujarat.

The proposal is for Environmental & CRZ Clearance for DEVELOPMENT OF NORTH SIDE OF BHAVNAGAR (NEW) PORT AT BHAVNAGAR, GUJARAT with handling capacity 4.65 MTPA. As the cargo handling capacity/port /harbour capacity of the Jetty is < 5 million TPA, the project falls in B category of the project / activity no. 7(e) in the schedule of the EIA Notification, 2006.

Sr No.	Commodities	Capacity (MTPA)
1	Edible Oil	0.02
2	Ro-Ro	0.03
3	General Cargo	0.19
4	CNG	0.24
5	Fertilizer	0.29
6	LPG	0.29
7	Chemical	0.30
8	Containers	3.29

The project activity is covered in 7(e) and is of 'B' Category. Public consultation is not applicable as per the paragraph 7(i) iii (i) (b) of the Environment Impact Assessment Notification-2006.

The SEAC, Gujarat vide their letter dated 02/09/2022 had recommended to the SEIAA, Gujarat, to grant the Environment Clearance for the above-mentioned project based on its meeting held on 02/09/2022. The GCZMA had also vide their letter dated 02/09/2022 had recommended to the SEIAA, Gujarat, to grant the CRZ Clearance for the above-mentioned project based on its meeting held on 14/07/2022. The proposal was considered by SEIAA, Gujarat in its meeting held on 02/09/2022 at Gandhinagar. After careful consideration, the SEIAA hereby accords Environmental & CRZ Clearance to above project under the provisions of EIA Notification dated 14<sup>th</sup> September, 2006 & CRZ Notification, 2011 subject to the compliance of the following conditions,

**A. CONDITIONS:**

**A.1. SPECIFIC CONDITION:**

M/s Bhavnagar Port Infrastructure shall carry out mangrove plantation @ 1000 Hectare area in consultation concerned Forest Department/Gujarat Ecology Commission within three years and submit detail report periodically to this office with relevant details.

Monitoring of ecological sensitive areas shall be monitored on regular basis by IIT, Gandhinagar. IIT Gandhinagar shall also carry out periodical monitoring for coastal and marine environment of the proposed project areas. IIT, Gandhinagar shall monitor the construction phase also.

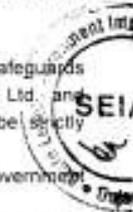
PP shall submit the complete construction plan and adhere to that.



Office : Gujarat Pollution Control Board, "Paryavaran Bhavan" Sector-10 A, Gandhinagar-382010  
Phone No.:- (079) 232-32152,332-41514 Fax No.:- (079) 232-22784  
E-mail : msseiaa@gmail.com, Website:- www.seiaa.gujarat.gov.in

Page 1 of 7

4. PP shall submit Lease Agreement made between project proponent and GMB to this office
5. PP shall submit final Approved CRZ map of NCSCM within one /two months period to this office.
6. Unit shall store CNG on Mobile trailer and obtain PESO permission and submit copy to this Office
7. No external Pipeline shall be installed as per submission of Bhavnagar port wide their letter dated 1 August 2022.
8. Natural gas pipeline will be provided by GSPC only after obtaining necessary permission from competent authority
9. PP shall create environment management cell and provide adequate fund to manage environment management cell.
10. PP Shall not disturb any other mangroves & its buffer areas than those 52 factor areas proposed to be lost before the GCZMA.
11. PP Shall not carry out any other activity which is not permissible in CRZ notification and comply all conditions of NOC issued by GPCB as well as GMB
12. PP Shall submit duly signed and stamped report of coastal and marine environment monitoring by IIT, Gandhinagar on time-to-time basis to GCZMA and SEIAA.
13. PP Shall submit the management plan of Ecological sensitive areas including biological active mudflats prepared by reputed agency within project areas to GCZMA and adhere to the plan prepared and accordingly manage the biological active mudflats.
14. PP shall obtain all the approval/NOC from concerned authority/ies as deemed fit for the proposed development.
15. All necessary permissions from different Government Departments / agencies shall be obtained by the Project Proponent before commencing the expansion activities
16. The provisions of the CRZ Notification of 2011 shall be strictly adhered to by Bhavnagar port infrastructure pvt ltd. No activity in contradiction to the provisions of the CRZ Notification shall be carried out by the Bhavnagar port infrastructure pvt ltd
17. The Environmental and CRZ Clearance to the project is primarily under provisions of EIA Notification, 2006 and CRZ Notification, 2011. It does not tantamount to approvals/consent/permissions etc required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes as applicable to the project.
18. Bhavnagar port infrastructure pvt ltd shall obtain prior permission from GMB.
19. All the recommendations EMP, mitigation measures, environmental protection measures and safeguards proposed in the EIA report of the project prepared by M/s: Indomer Coastal Hydraulics P. Ltd. and commitments made during presentation before SEAC and proposed in the EIA report shall be strictly adhered to in letter and spirit by Bhavnagar port infrastructure pvt ltd.
20. Bhavnagar port infrastructure pvt ltd. shall obtain all necessary permissions from different Government Departments / Agencies before commissioning their activities.
21. Bhavnagar port infrastructure pvt ltd. shall obtain necessary permission from the Gujarat Maritime Board for marine structure, necessary permission under The Wildlife protection Act, if required, before commencing their activities.
22. Bhavnagar port infrastructure pvt ltd. shall ensure that there shall be no discharge of any effluent/sewage in to marine environment.
23. Dredging shall be carried out as and when require as mention in EIA report. All conditions of the CRZ clearance to be followed in letter and spirit.
24. Disposal of dredged to be generated during maintenance dredging shall be done as per the recommendations of scientific study carried out by Indomer, which is part of EIA report.
25. No groundwater shall be tapped to meet with the water requirements during the construction and/or operation phases.
26. Bhavnagar port infrastructure pvt ltd. shall ensure that there shall be no damage to the existing mangrove patches near the site and also ensure the free flow of water to avoid damage to the mangrove (if any)
27. Bhavnagar port infrastructure pvt ltd shall carry out Mangrove plantation as per MoU with Gujarat Ecology Commission
28. Bhavnagar port infrastructure pvt ltd. Shall ensure that there shall not be any discharge of pollutants in to Sea, Creek etc., which affects the marine water and marine ecology like discharge from barges, accidental spillage of oils from barges etc.



29. Bhavnagar port infrastructure pvt ltd. shall take up green belt development activities in propose project premises. Bhavnagar port infrastructure pvt ltd. shall take up mangroves plantation to be suggested in CRZ Clearance in consultation with the Forests Department / GEER Foundation / Gujarat Ecology Commission. A comprehensive plan for this purpose has to be submitted to the Forests & Environment Department SEIAA and MoEF&CC.
30. Detailed traffic control management plan shall be prepared and its recommendations shall be strictly followed / adhered to in order to reduce adverse impacts and to avoid problems to fishermen.
31. There shall be no use of any Hazardous chemicals within Jetty area

#### **A.2 CONSTRUCTION PHASE:**

32. No construction debris and / or any other type of waste / wastewater shall be disposed of in CRZ areas.
33. Construction materials and debris shall be properly stored and handled to avoid negative impacts such as air pollution and public nuisances by blocking the roads and public passages. The debris shall be removed from the construction site immediately after the construction is over.
34. It shall be ensured that there is no adverse impact on the drainage of the area due to the construction activities.
35. Solid waste likely to be generated from construction site and labour camps during construction phase will be collected and disposed off as per the Solid Waste Management Rules – 2016.
36. Vessels/ barges operating during construction phase shall be equipped with spill response kits.
37. The construction camps shall be kept outside the CRZ areas and the construction labour shall be provided with adequate amenities like drinking water, fuel, sanitation, etc. to ensure that the existing environmental condition is not deteriorated by them.
38. Topsoil excavated during construction activities shall be stored for use in horticultural / landscape development within the project site.
39. Ready Mix Concrete should be used so far as possible. Water demand during construction should be reduced by use of curing agents, plasticizers and other best practices.
40. The Diesel Generator Set, if to be provided during the construction phase shall be of enclosed type and conforming to the EPA Rules for air and noise emission standards.
41. The overall noise level in and around the jetty area shall be kept well within the standards by providing noise control measures including engineering controls on all sources of noise generation. The ambient noise level shall conform to the standards prescribed under The Environment (Protection) Act, 1986 & Rules.
42. Vehicles hired for bringing construction material at site should be in good conditions and conform to applicable air and noise emission standards and should be operated only during non-peak hours.
43. Fly ash should be used as building material in the construction as per provisions of Fly Ash Notification under EPA.

#### **A.3 OPERATION PHASE:**

##### **A.3.1 WATER:**

44. Total water requirement for the project shall not exceed 37.35 KLD and shall be met through municipal sources, via Narmada and through tankers & pipelines.
45. No ground water shall be tapped in any case for the project requirements.
46. The water meter shall be installed and records of monthly water consumption shall be maintained regularly.
47. There shall be no generation of industrial waste water.
48. The domestic wastewater generation shall not exceed 31.74 KLD and it shall be treated in STP.
49. There shall be no generation of Bilge water during operation phase as submitted before SEAC.

##### **A.3.2 AIR:**

50. Adequate stack height as per prevailing norms shall be provided for the flue gas emissions and flue gas emission shall conform to the norms prescribed by the GPCB at the stack outlet.
51. Diesel to the tune of 12.54 Kl/day shall be used as a fuel in Four D. G. Set (2500, 630,630,280 KVA) and adequate stack height shall be provided as per the CPCB norms. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution and conforming to the EPA Rules for air and noise emission standards.
52. Adequate measures shall be taken to avoid odor nuisance.
53. The fugitive emission in the work zone environment shall be monitored. The emission shall conform to the standards prescribed by the concerned authorities from time to time (e.g. Directors of Industrial Safety & Health). Following indicative guidelines shall also be followed to reduce the fugitive emission.
  - Internal roads shall be either concreted or asphalted or paved properly to reduce the fugitive emission during





the prevailing Rules / Gujarat Fire Prevention and Life Safety Measures Act, 2016

71. PP shall carry out mock drill within the premises as per the prevailing guidelines of safety and display proper evacuation plan in the manufacturing area in case of any emergency or accident.
72. PP shall install adequate fire hydrant system within premises and separate storage of water for the same shall be ensured by PP
73. PP shall take all the necessary steps for control of storage hazards within premises ensuring incompatibility of storage raw material and ensure the storage keeping safe distance as per the prevailing guidelines of the concerned authority.
74. PP shall take all the necessary steps for human safety within premises to ensure that no any harm is caused to any worker/employee or labour within premises.
75. Flame proof electrical fittings shall be provided in the jetty premises, wherever applicable.

**A. 3.6 NOISE:**

76. The overall noise level in and around the Jetty area shall be kept well within the prescribed standards by providing noise control measures including acoustic insulation, hoods, silencers, enclosures vibration dampers etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under the Environment (Protection) Act and Rules. Workplace noise levels for workers shall be as per the Factories Act and Rules.

**A. 3.6 CLEANER PRODUCTION AND WASTE MINIMISATION:**

77. High pressure hose shall be used for cleaning / washing in order to reduce wastewater generation.

**A. 3.7 GREEN BELT AND OTHER PLANTATION:**

78. The PP shall develop green belt of (7.36 ha) as submitted before SEAC. Green belt shall be developed as avenue plantation with native plant species that are significant and used for the pollution abatement as per the CPCB guidelines.
79. Drip irrigation / low-volume, low-angle sprinkler system shall be used for the green belt development within the premises.

**B. OTHER CONDITIONS:**

80. All the natural flora and fauna, water courses and channels while developing the project. It should be seen that least damage are done to them and should be done under the supervision of GMB
81. In the event of failure of any pollution control system adopted by the unit, the unit shall be safely closed down and shall not be restarted until the desired efficiency of the control equipment has been achieved.
82. All the recommendations, EMP, mitigation measures, environmental protection measures and safeguards proposed in the EIA report of the project prepared by M/s Indomer Coastal Hydraulics P. Ltd. and commitments made during presentation before SEAC and proposed in the EIA report shall be strictly adhered to in letter and spirit by Bhavnagar port infrastructure pvt ltd
83. A separate budget shall be earmarked for environmental management and socio-economic activities including the greenbelt / mangrove plantation and details thereof shall be furnished to F&ED, SEIAA as well as MoEF, Govt. The details with respect to expenditure from this budget head shall also be furnished along with compliance report.
84. A separate environmental management cell with qualified personnel shall be created for environmental monitoring and management during construction and operational phases of the project.
85. The project shall be implemented in such a manner that there shall be no any hindrance to movement of fishing vessels or fishermen
86. Bhavnagar port infrastructure pvt ltd. shall bear the cost of the external agency that may be appointed by SEIAA or Forests & Environment Department (F&ED), Gujarat for supervision / monitoring of proposed activities and the environmental impacts of the proposed activities.
87. Bhavnagar port infrastructure pvt ltd shall regularly submit the half-yearly compliance report on the conditions stipulated in hard and soft copies to the regulatory authorities concerned, on 1st June and 1st December of each calendar year.
88. Any other condition that may be stipulated by the SEIAA / F&ED from time to time for environmental protection / management purpose shall have to be complied with by the Bhavnagar port infrastructure pvt ltd.
89. The project authorities must strictly adhere to the stipulations made by the Gujarat Pollution Control Board (GPCB), State Government and any statutory authority
90. No further expansion or modifications in the project likely to cause environmental impacts shall be carried



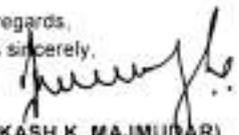
out without obtaining prior Environment Clearance from the concerned authority.

91. The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Hazardous and Other Wastes (Management and Transboundary Movement) Rules 2016 and the Public Liability Insurance Act, 1991 along with their amendments and rules.
92. The company shall undertake socio-economic developmental / community welfare activities as per the CSR Rules 2014.
93. The project proponent shall carry out the entire activities like Education, Infrastructure, Health and Environment proposed under Corporate Environment Responsibility (CER) and it shall be part of the Environment Management Plan (EMP) as per the MoEF&CC's OM no. F. No. 22-65/2017-IA.III dated 30.09.2020. This shall be monitored and the monitoring report shall be submitted to the regional office of MoEF&CC as a part of half-yearly compliance report and to the District Collector. The monitoring report shall be posted on the website of the project proponent.

**C. COMPLIANCE OF ENVIRONMENT CLEARANCE (REPORTING/ ADMINISTRATION / APPEAL)**

94. Project proponent shall inform to all the concerned authorities including Municipal Corporation, District Collector & Gujarat Maritime Board and shall also give wide publicity through advertisement in minimum two local newspapers within seven days, about the Environment Clearance order accorded.
95. Project proponent shall appoint a key person in the organization who shall be responsible for compliance of above condition fully on behalf of the proponent. It will not mean that appointing a key person will exempt the project proponent from the responsibility of compliance. Any change in key person shall immediately be informed to SEIAA and all concerned authorities.
96. Designated key person shall submit six monthly compliance report to SEIAA/SEAC, MOEF&CC, GPCB and Nodal Department of the Government.
97. The Nodal Department or any authority or officer authorized by MOEF&CC/SEIAA can inspect the site of the project and all the facilities, for verification of compliances of environment clearance conditions.
98. In case of violation reported upon, the project proponent shall be responsible for all the legal actions as per Environment Protection Act, 1986 including SEIAA may cancel, withdraw or keep in abeyance, the Environment Clearance accorded.
99. Any person including the project proponent affected by this Environment Clearance order may file appeal to Honorable National Green Tribunal, West Zone branch, Pune, preferably within a period of thirty days from the date of issue of Environment Clearance as prescribe under section 16 of National Green Tribunal Act 2010.
100. All complaints and public grievance or representations may be addressed to SEIAA/SEAC in the email addresses (a) msseiaag@gmail.com & (b) seacgujarat@gmail.com

With regards,  
Yours sincerely,

  
(PRAKASH K. MAJMUDAR)  
Member Secretary

Issued to:  
TO  
The Director,  
Bhavnagar Port Infrastructure Pvt. Ltd.,  
401, 4th floor, 638, 2nd lane, Panchvari,  
Gulbai tekra,  
Ahmedabad-380006.

- Copy to:-
- 1 The Secretary, SEAC, C/O G.P.C.B, Gandhinagar - 382010
  - 2 The Member Secretary, Gujarat Coastal Zone Management Authority, Block No.14, 8th floor, Forest & Environment Department, New Sachivalay, Gandhinagar.
  - 3 The Additional Chief Secretary, Forests & Environment Department, Govt. of Gujarat, Block 14, 8<sup>th</sup> floor, Sachivalaya,

Gandhinagar-382010

4. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD -cum-Office Complex, East Arjun Nagar, New Delhi-110032
5. The Chief Conservator of Forests (Central), Ministry of Environment & Forests, Regional Office (WZ), E-5, Arera Colony, Link Road-3, Bhopal-462016, MP
6. Monitoring Cell, Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, New Delhi-110003
7. The Member Secretary, Gujarat Pollution Control Board, Paryavaran Bhavan, Sector-10 A, Gandhinagar-382010
8. Select File



**Annexure - 2**

## **MEMORANDUM OF UNDERSTANDING**

**To carry out  
“COMPENSATORY MANGROVE PLANTATION”**

**Between**



**Bhavnagar Port Infrastructure Pvt. Ltd.  
Ahmedabad**

**&**



**Gujarat Ecology Commission  
Government of Gujarat  
Gandhinagar**

**Dt. 04<sup>th</sup> June 2022**

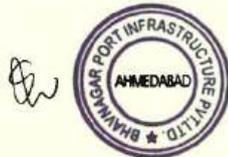


### **MEMORANDUM OF UNDERSTANDING**

This Memorandum of Understanding signed on 4<sup>th</sup> day of June, 2022 between, **Bhavnagar Port Infrastructure Private Limited**, 401, 637 Complex, Panchvati 2<sup>nd</sup> Lane, Gulbai Tekra Road, Ahmedabad (hereinafter referred to as BPIPL) and **Gujarat Ecology Commission**, Government of Gujarat, Block-18, 1st Floor, Udhog Bhavan, Sector-11, Gandhinagar, 380017, (hereinafter referred to as GEC) to implement the project 'Restoration, Plantation & Conservation of Mangroves on coastline of Gujarat.

#### **WHEREAS**

- (A) GEC, Forest & Environment Department, has been inter-alia engaged in the mangrove plantation activities as part of its mandate to work for restoration of ecologically degraded areas to ensure the ecological health of Gujarat systematically. The guideline towards such project is mentioned in Annexure - I hereunder.
- (B) BPIPL is developing the North of Bhavnagar Port in accordance with the Letter of Intent issued by Gujarat Maritime Board dated 15<sup>th</sup> September 2020. BPIPL has applied for environment clearance of the said project. As directed by the State Expert Appraisal Committee for Environment Clearance, BPIPL is required to undertake a compensatory mangrove afforestation of 210 ha, which is 3 times of 70 ha of mangrove likely to be impacted due the proposed development.
- (C) Accordingly, BPIPL, Ahmedabad approached Gujarat Ecology Commission, Government of Gujarat vide letter No. BPIPL/2022/100 dated 3/6/2022 to undertake compensatory mangrove afforestation ("the Project) and accordingly GEC agreed for the same by executing this Memorandum of Understanding (MoU).



**NOW THEREFORE** both the parties have agreed as follow:

**1. Cost of the Project**

No.	Project Proposal	Project Outlay Amount (Rs. in lacs)
1.	Compensatory Mangrove Plantation, Conservation and Management Projects at designated costal area of <b>210</b> Hectors by GEC. Rate per hector for this purpose will be Rs. 50,000 per ha.)	<b>Rs. 105.00</b>

**2. Project Period**

The project period will be as follow.

Sr. No.	Plantation Year	Plantation Target	Project Area identified for Mangrove Plantation and Maintenance
1.	2023 – 24	210 Ha	Village: Ambheta (Aliya Bet) Ta. Hansot, Di. Bharuch, Gujarat <b>(Annexure – II)</b>
3.	2024 – 25	Maintenance Period	

**3. Budget Estimates**

Budget Estimates for this project as shown in Annexure – I. The cost of mangrove plantation work is **Rs. 1,05,00,000 @ Rs. 50,000.00/- per ha.**

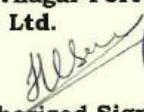
**4. Payment Terms & Conditions:**

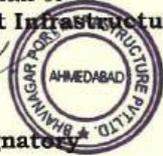
Sr. No.	Terms & Conditions	Rs. (in Lakh)
1.	50% of total the Project outlay within 30 days on receipt of Construction Permission of north side of Bhavnagar Port by Gujarat Maritime Board or Dt. 01 <sup>st</sup> April 2023 whichever is earlier.	<b>Rs. 52.50</b>
2.	50% of total project amount after completion of Nursery Preparation.	<b>Rs. 52.50</b>
<b>Total</b>		<b>Rs. 105.00</b>



This Memorandum of understanding has been signed by both parties to facilitate BPIPL to get associated with GEC for compensatory mangrove plantation activities and shall fund this project for Compensatory Mangrove plantation of 210 ha. at Village: Ambheta (Aliya Bet) Ta. Hansot, Di. Bharuch, Gujarat as per annexure to this agreement towards ensuring the sustainable environment and ecological balance through aforesaid project in Gujarat State in time bound manner, which can be extended by GEC based on the force major condition including changes in the weather and costal water circumstances. The other terms and conditions shall be as per the guidelines issued by the Government in this behalf as mentioned in the annexure to this.

FOR and on behalf of  
**Bhavnagar Port Infrastructure  
Pvt. Ltd.**

  
**Authorized Signatory**



FOR and on behalf of  
**Gujarat Ecology Commission**

  
**Authorized Signatory**



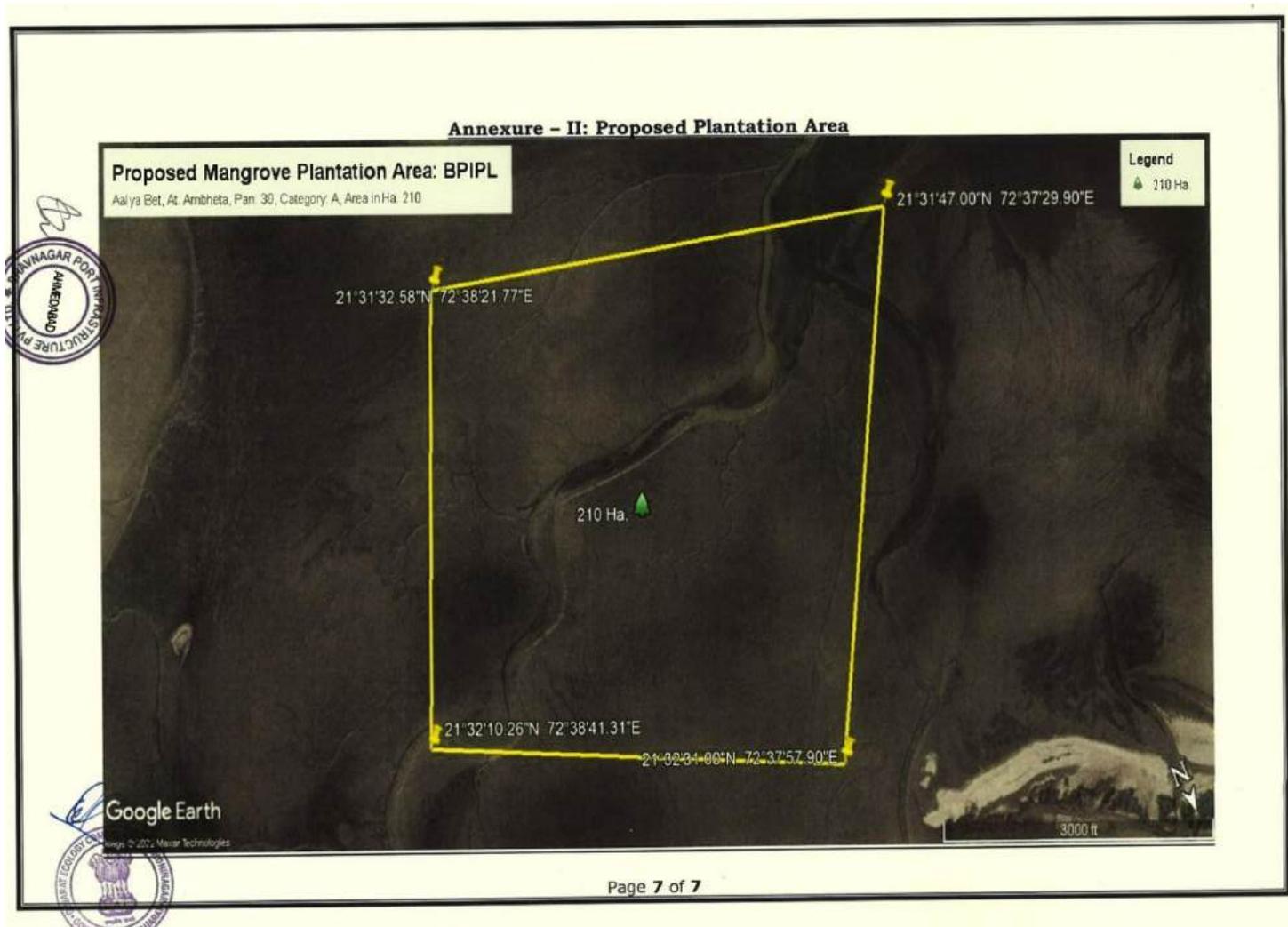


contractor-client relationship does not hold good; therefore, **no TDS should be deducted.**

5. GEC will be responsible to submit progress report on a mutually agreed interval to the partnering industries/corporates/institutions and also facilitate to carry out monitoring/visit of partner industries as well as certificate will be issued stating the completion of said work.
6. The cost of mangrove plantation works out to be **i. e. 50,000/- per ha** during the year 2013-14 and this may be subsequently revised based on the changes in daily wages rate from time to time.
7. Partnering industry/corporate can appoint any third-party monitoring agency, if they wish so, at their own cost.

-SD-  
[DIRECTOR]  
GUJARAT ECOLOGY COMMISSION







BPIPL/2022/136

22<sup>nd</sup> September 2022

To  
**The Member Secretary**  
**SEIAA (Gujarat)**  
Gujarat Pollution Control Board.  
"Paryavaran Bhavan", Sector-10 A  
Gandhinagar- 382 010

**Sub: Regarding compliance towards Environment Clearance for the 'Development of Brownfield Port at the North Side of Bhavnagar Port (New Port)**

**Ref: Environment Clearance vide letter SEIAA/GUJ/EC&CRZ/7(e)/2042/2022 dated 03<sup>rd</sup> September 2022**

Dear Sir,

This is with reference to the Environment Clearance obtained by Bhavnagar Port Infrastructure Private Limited (BPIPL) above reference.

BPIPL would like to inform the honourable office that they have initiated the necessary processes for the compliance towards environment clearance. BPIPL notified the concerned authorities and published the advertisements on two local newspapers on 8<sup>th</sup> September 2022 as per the condition C.94 of the environment clearance, copies of the same are attached herewith.

To meet conditions such as A.1.1 regarding mangrove afforestation of 1000 ha within three years, BPIPL have initiated the process with Gujarat Ecology Commission for the planning, execution and finalization of locations for mangrove afforestation.

As per the condition A.1.2, BPIPL have also approached IIT Gandhinagar for the monitoring of ecological sensitive areas, meeting of which will be held soon.

BPIPL shall submit further details in the half-yearly compliance report as per the conditions of the environment clearance.

Regards,  
For **Bhavnagar Port Infrastructure Private Limited**

  
**Hitendra Solanki**  
Director



Encl. As above

Copy To:

1. Director Environment, Forest & Environment Department, Government of Gujarat

**Bhavnagar Port Infrastructure Pvt. Ltd.**

401, 637 Complex, Panchvati 2nd Lane, Gulbai Tekra Road, Ahmedabad - 380006, Gujarat, INDIA  
Phone : +91 79 2964 7277 Website : www.bhavnagarport.in CIN : U45309GJ2019PTC111053

**Annexure - 3**



BPIPL/2022/151

01<sup>st</sup> November 2022

To  
**The Member Secretary**  
**SEIAA (Gujarat)**  
Gujarat Pollution Control Board,  
"Paryavaran Bhavan", Sector-10 A  
Gandhinagar- 382 010

**Sub: Regarding compliance towards Environment Clearance for the 'Development of Brownfield Port at the North Side of Bhavnagar Port (New Port)**

**Ref: Environment Clearance vide letter SEIAA/GUJ/EC&CRZ/7(e)/2042/2022 dated 03<sup>rd</sup> September 2022**

Dear Sir,

This is with reference to the Environment Clearance obtained by Bhavnagar Port Infrastructure Private Limited (BPIPL) above reference.

As per the condition A.1.5 of the environment clearance, the hard copy of the final approved CRZ Map prepared by NCSCM was received on 31<sup>st</sup> October 2022 and is enclosed herewith along with this letter.

BPIPL shall submit further details in the half-yearly compliance report as per the conditions of the environment clearance.

Regards,  
For **Bhavnagar Port Infrastructure Private Limited**

  
**Hitendra Solanki**  
**Director**



*Encl. As above*

Copy To:

1. Director Environment, Forest & Environment Department, Government of Gujarat

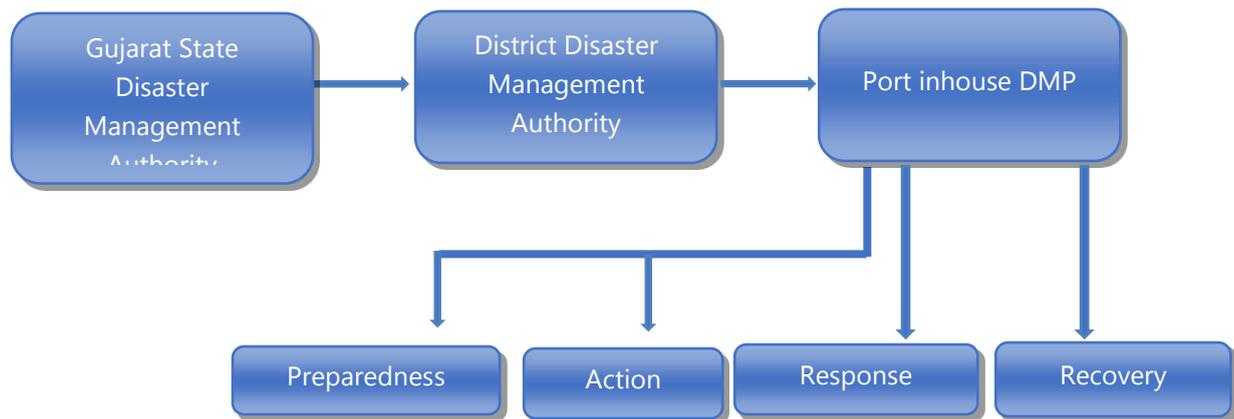
**Bhavnagar Port Infrastructure Pvt. Ltd.**

401, 637 Complex, Panchvati 2nd Lane, Gulbai Tekra Road, Ahmedabad - 380006, Gujarat, INDIA  
Phone : +91 79 2964 7277 Website : [www.bhavnagarport.in](http://www.bhavnagarport.in) CIN : U45309GJ2019PTC111053

**Annexure 4 - Disaster  
management plan**

## Disaster management plan

Emergency/ disaster is an undesirable occurrence of events of such magnitude and nature that adversely affect operations, cause loss of human lives and property as well as damage to the environment. Coastal infrastructure is vulnerable to various kinds of natural and manmade disasters. Examples of natural disaster are Flood, Cyclone, Tsunami, Earthquake etc., and manmade disasters like major fire, explosion, sudden heavy leakage of toxic/ poisonous gases, etc. An effective disaster management plan helps to minimize the losses in terms of human lives, assets and environmental damage.



Overall disaster management hierarchy

### Objective of Disaster Management Plan

DMP is developed to make best possible use of the resources available in the operational area as well as outside available resources like State Fire Services, Police, Civil Defence, Hospitals, Civil Administration, neighbouring institution and industries.

The objectives of Disaster Management Plan are:

- To contain and control the incident.
- To rescue the victim and treat them suitably in quickest possible time.
- To safeguard other personnel and evacuate them to safer places.
- To identify personnel affected/dead.
- To give immediate warning signal to the people in the surrounding areas in case such situation arising.
- To inform relatives of the casualties.
- To safeguard important records & information about the organization.
- To preserve damaged records & equipment needed as evidence for any subsequent enquiry.
- To rehabilitate the affected areas.
- To restore the facilities to normal working condition at the earliest.

Gujarat state Disaster Management authority has prepared Disaster Management Plan for tsunami, earthquake and cyclone. The Revenue department is primarily responsible for emergency response and relief (DM Act - Section 12(2)(b)) in the State, while the Gujarat State Disaster Management

Authority (GSDMA) is designated as the nodal agency for formulation of policies, long-term planning, coordination and monitoring body for mitigation, reduction and preparedness for disasters in the State (DM Act - Section 12). Disaster management plans exist at District and Taluka levels in Gujarat. The District Collector is the chairman of the District Disaster Management Authority. The Taluka Disaster Management Committee is headed by Mamlatdar. This Committee will look into all the aspects of disaster management including mitigation preparedness, response and relief at Taluka level.

Standard operating procedures and action plan in case of manmade disasters like oil spill, fire accident, barge collision etc., at port shall be developed. New port terminals shall be well equipped to deal with oil spill contingency, fire hazard, barge collision etc.

### Disaster Identification

#### a) Natural disaster

A disaster occurs when a hazard such as Earthquake, Flood or Cyclone coincides with a vulnerable situation. Based on project details, geography, environmental setting of the study area and available information (*District Disaster Management Plan, Bhavnagar 2019*) following hazards have been identified which may possibly lead to disaster. The probability/seasonality of hazard which is likely to occur in the project area is also listed below.

Identified natural hazards in the study area			
Sl. No.	Hazard	Project area (Bhavnagar)	Findings
1	Earthquake	✓	Zone III (moderate risk zone)
2	Cyclone	✓	Open to wind speed of 50 m/sec and greater. (Highly vulnerable)
3	Sea surge and Tsunami	✓	Highly vulnerable
4	Flood	x	Low (may occur due to very heavy rainfall, sea surge or tsunami)

(Source: District Disaster Management Plan, Bhavnagar 2019)

Disaster identification suggests that the project site is vulnerable to natural hazards other than Flood. According to Bhavnagar District Disaster Management Plan, probability of flood in entire district is low and it may occur only in the event of very heavy rainfall, sea surge or tsunami. Among the identified impacts, Cyclone, Sea surge and Earthquake are most probable to occur in the vicinity of project area. Probability period and seasonality of natural disasters is given below.

Probability Period/Seasonality of disasters		
Type of hazards	Time of occurrence	Potential impact
Flood	June – September	Loss of life, livestock, crop and infrastructure
Earthquake	Anytime	
Cyclone	March - May September - November	
Tsunami	Anytime	

(Source: District Disaster Management Plan, Bhavnagar 2019)

## History of Natural Disasters in Bhavnagar District

History of disasters occurred in Bhavnagar is given below.

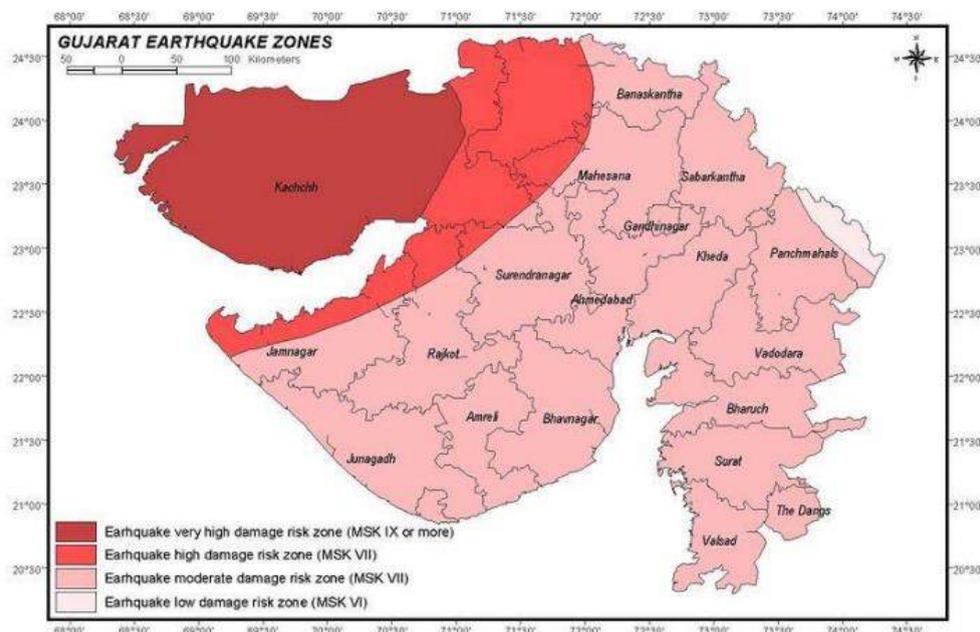
Year	Details
1982	On 8th November 1982, Bhavnagar faced a tropical cyclone of 150 kmph.
1999	Cyclone of 80 - 100 kmph hit various parts of Bhavnagar District leading to death of 5 peoples.
2001	Bhavnagar experienced destructive earthquake leading to death of 4 peoples.
2002	Heavy rain created flood in Palitana, Bhavnagar and Sihor Taluka of the District. 19147 people were affected, and 8 people were died.
2007	Heavy rain and flood. 40 people died in different area within the District.
2015	Heavy rain and flood. It affected whole District especially some area of Palitana city and Talaja city and 4 villages of Gariyadhar and Jesar taluka. 8 people were died and there was heavy loss of property.
2018	Villages of Mahuva, Talaja and Jesar taluka were affected due to heavy rain.

(Source: District Disaster Management Plan, Bhavnagar 2019)

Even though Bhavnagar is more vulnerable to cyclone, earthquake and Tsunami/sea surge, over the past 15 years District has no history of them. Heavy rainfall and flooding are reported in 2002, 2007, 2015 and 2018.

### (i) Earthquake

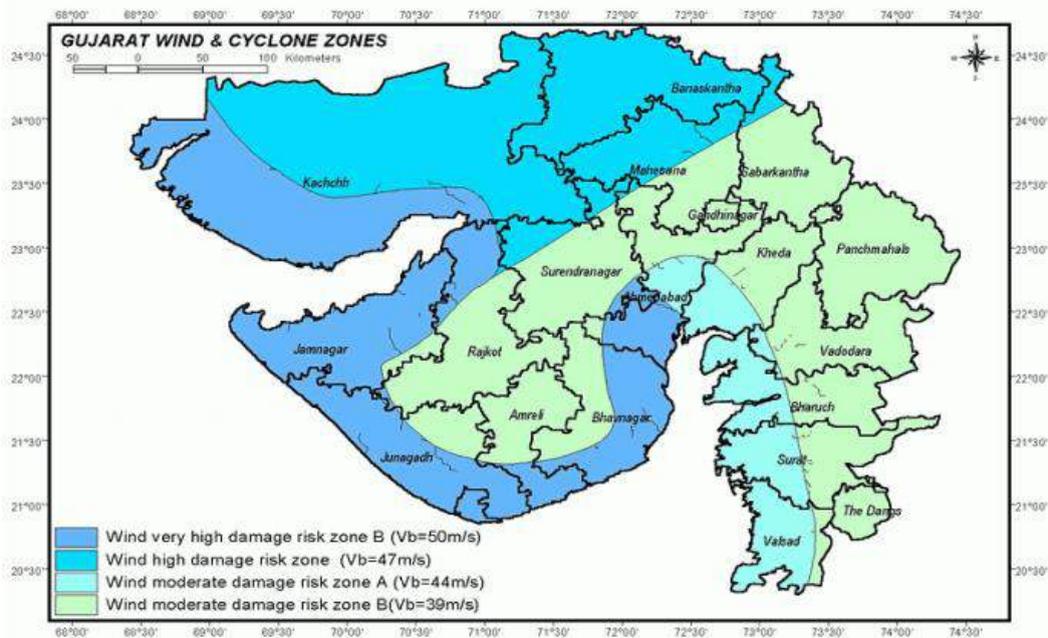
As per Indian Seismic Zone Map, Gujarat lies in three zones- Zone III, IV and V. Entire Bhavnagar District lies in zone III where earthquakes of moderate intensity can be expected. Earthquake map of Gujarat is given below.



Gujarat earthquake zone map

## (ii) Cyclones

Gujarat having the longest coastline of 1600 Kms. in the country is highly vulnerable to cyclone and storm surge. Gujarat Wind and Cyclone zone map indicates that project site and neighboring coastal villages can be exposed to high wind speed of greater than 50 m/sec during the event of cyclonic storm. Gujarat wind zone is presented below.



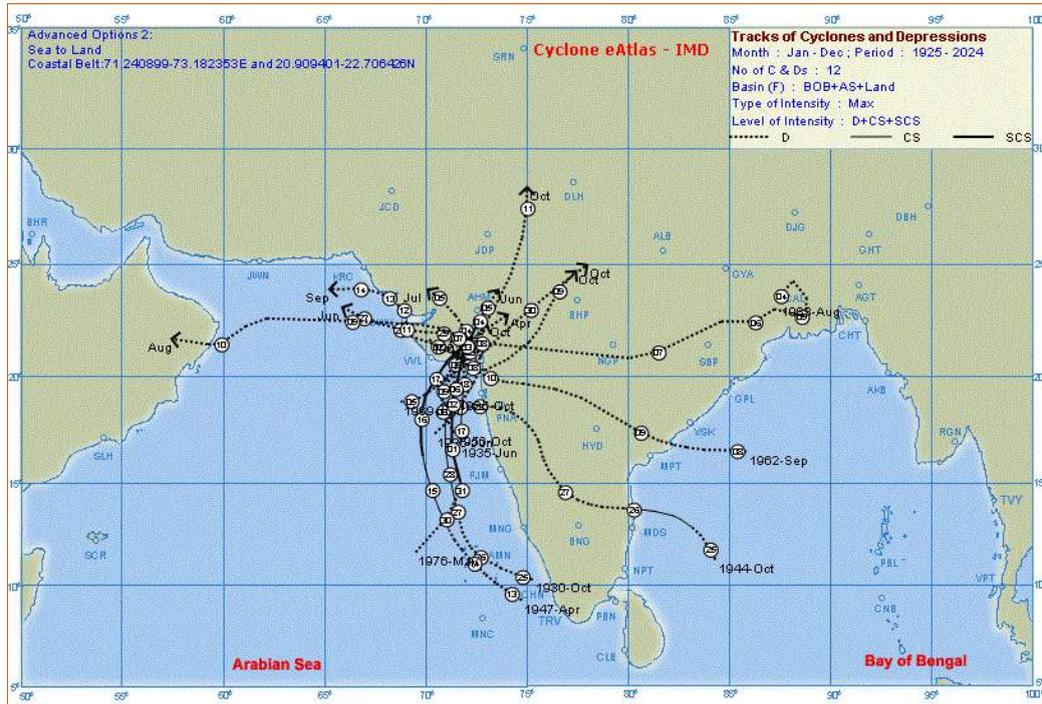
Gujarat wind

The tracks of cyclones which have crossed the coast near Bhavnagar (within 100 km on either side) during 1925 to 2024 are presented in the below Table and the track of cyclones is also shown below. It indicates that totally 12 storms had occurred in the vicinity of the project region in the last 100 years. The occurrence of storms in this region are more frequent in October (4) followed by June (03), April (01), May (01), July (01), August (01) and September (01)

Table 1. Number of cyclones crossed within 100 km radius (1924 – 2023)

Month	Cyclones crossed within 100 km project radius
January	0
February	0
March	0
April	1
May	1
June	3
July	1
August	1
September	1
October	4
November	0
December	0
<b>Total</b>	<b>12</b>

Source: cyclone e-atlas published by IMD – 2024



Tracks of Cyclones and Depressions, 1925 - 2024 (100 km project radius)

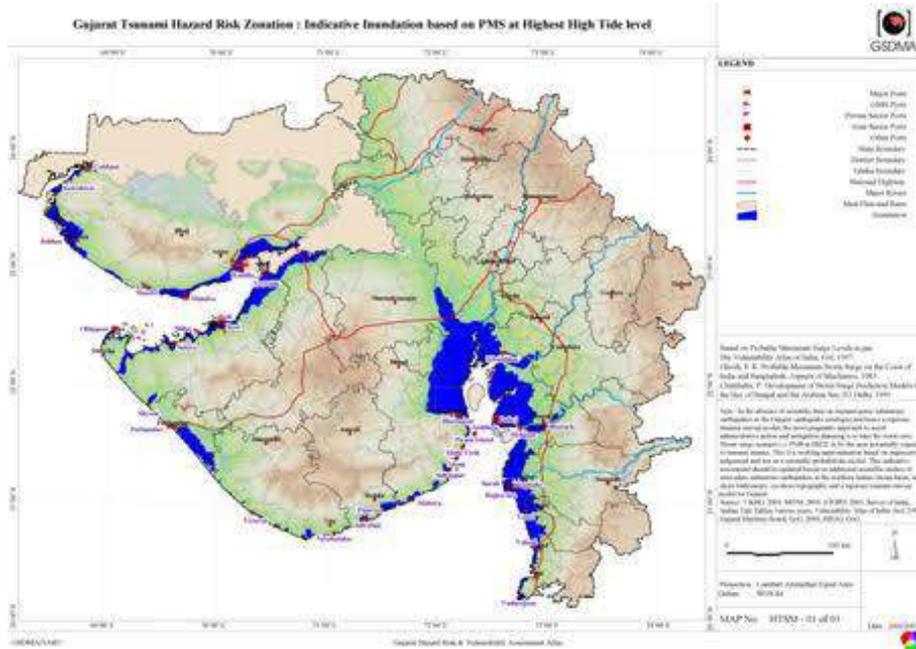
### (iii) Tsunami

Gujarat is prone to tsunami risk due to its long coastline and probability of occurrence of near and offshore submarine earthquakes in the Arabian sea. Bhavnagar District is classified under prone to tsunami as per Hazard Risk and Vulnerability Atlas prepared by GSDMA. Areas at greatest risk are those which have less than 25 ft above sea level and within one mile of the shoreline. Most deaths caused by a tsunami are because of drowning, associated risks include flooding, contamination of drinking water, fires from ruptured tanks or gas lines, and the loss of vital community infrastructure. Probability of flooding of project site during tsunami is high.

Tsunami vulnerability assessment is carried out based on Probable Maximum Surge (PMS) at Highest High Tide Level. Maximum possible inundation at Highest High Tide Level (HHTL) and 100% Probable Maximum Surge (PMS) for some of the talukas of Bhavnagar District is given below. Map showing Gujarat tsunami hazard risk zonation is also presented below:

Tsunami hazard risk zonation based on PMS at Highest High Tide Level (HHTL)		
District Name	Taluka	Maximum possible inundation (Area of Taluka in %) at Highest High Tide Level (HHTL) and 100 % Probable Maximum Surge (PMS)
Bhavnagar	Bhavnagar	73
	Ghogha	04
	Mahuva (B)	05
	Sihor	04
	Talaja	14
	Vallabhipur	30

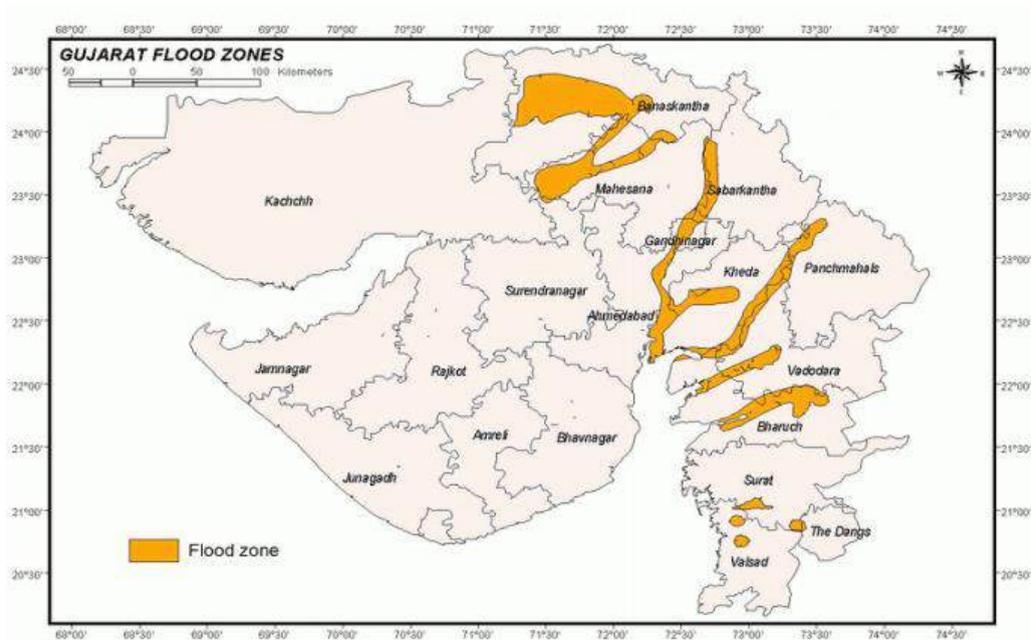
(Source: Gujarat State Tsunami Management Plan, 2009)



Gujarat tsunami hazard risk zonation map

**(iv) Flood**

In general Bhavnagar District is not prone to flood. However, it can occur during extreme rainfall/storm surge etc. Flood zonation map of Gujarat is given below.



Gujarat flood zonation map

## b) Manmade disasters

In port operational premises manmade risk events can occur due to the following.

- i) Accidental barge collision
- ii) Accidental oil spillage
- iii) Fire accident
- iv) Operational activities such as loading/unloading, handling and transportation of cargoes.

## Seismic Design

Earthquake loads are adopted as applicable for the site as per IS 1893-2002. Proposed location falls under Zone III as per the seismic map of India (IS-1893-2002). Design horizontal seismic coefficient is evaluated as per procedure detailed in IS 1893-2002.

The horizontal seismic coefficient is as follows.

- Seismic Zone: III
- $A_h = Z I (S_a/g)/(2R)$   
Where,  $A_h$  = Design horizontal seismic coefficient
- Z: Zone factor = 0.16
- I: Importance factor = 1.5
- R: Response reduction factor = 3 (For RCC structure) & 5 (For Steel structures)
- $S_a/g$ : Average response acceleration coefficient
- Time period of the structure will be evaluated by STAAD Analysis considering Dead Load + Super Imposed load + 50% Live Load.

## Fire fighting

The summary of fire protection provided in DPR is given below.

The design and planning of Fire Protection System will be done keeping in view the following criteria:

- National Building Code Sept 2005: Part IV for Fire Protection.
- Local Byelaws.
- Relevant BIS codes: Specifically, IS: 3044, IS: 5290 and IS: 5312, IS: 908 and IS: 2190, IS: 3844, IS: 15105.
- Compliance to local Chief Fire Officer norms.

Sl. No.	Area	Fire Protection Type
1	Container & general cargo terminals	Hydrant system
		Fire extinguishers
2	LPG, Chemical terminals	Hydrant system
		Medium velocity water spray system
		Fire extinguishers
		Jumbo curtain, Tower Monitors, Fire / Foam monitors, Deluge sprinkling systems
3	Port Fire Station	Water Tender
		Foam Tender
		FF gear and extinguishers

## On Site / Inhouse Emergency Preparedness

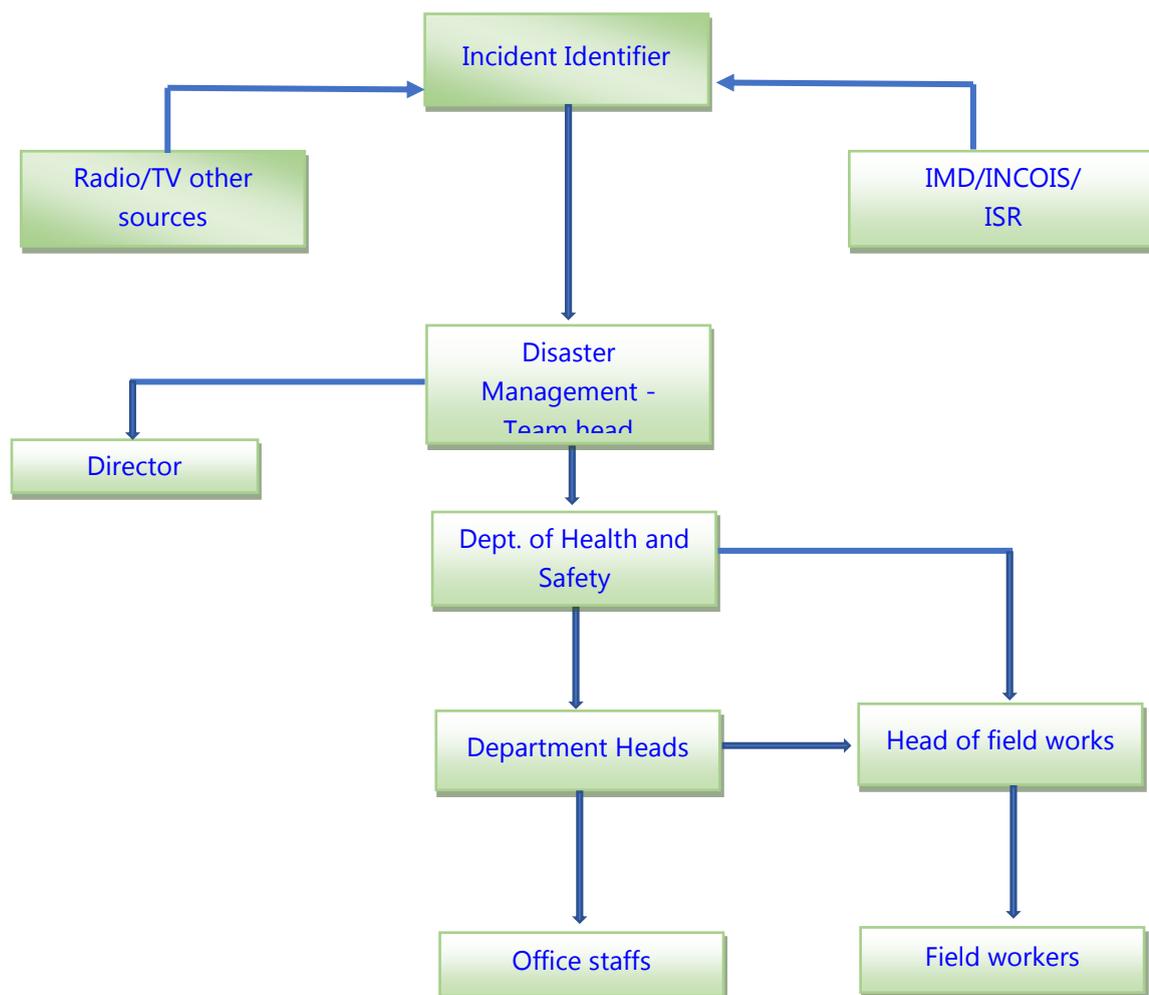
### For natural disasters

#### a) Incident Response Team

An incident management team shall be constituted at the project site. This team should have the following personnel:

- i) Head of port operations,
- ii) Control room officer,
- iii) Health and Safety officer,
- iv) Environment Management Cell,
- v) Department Heads,
- vi) Security Officers

This team should have the details of people on duty and their locations on daily basis. The evacuation plan should be available with the team. This team should have control on the emergency alarm. One staff should be designated to inspect the preparedness on a daily basis.



### b) Emergency Alarm

An emergency alarm /siren should be in place at the site area. The details of agencies competent enough for issuing warning or alert pertaining to various types of disasters are given below. In case of emergency when warning is given, the alarm at the site can be instantly activated and the vigilant team including the emergency response team can immediately start the evacuation and rescue operation. All the workers also should be advised to vacate and move to the designated safe places.

Details of agencies which give early warning systems	
Disaster	Agencies
Earthquakes	IMD/ISR
Floods	Meteorological Department, Irrigation Department
Tsunamis	INCOIS
Cyclones	IMD

### c) Emergency Rescue Kit

Minimum rescue resources should be kept in readiness. The following emergency rescue kit to be kept at the site.

- Lifesaving jackets
- 100 and 200 ft. ropes
- Flashlights
- Extra batteries
- Battery operated radio
- First aid kit etc.

### d) Assembly Point

Evacuation of people from risk areas is the priority when early warning is received, or the natural warning sign indicates the immediate arrival of cyclone, Tsunami wave or rise of storm surge.

Evacuation plan describes the time span available before and during the Tsunami or storm surge event. When facing local threat, evacuation procedures most possibly will have the character of a 'runaway effort' and people should not expect to receive much institutional support. The primary objective should be bringing as many people as possible out of the reach of impact to safe or 'relatively safe' areas. Therefore, necessary steps have to be taken in advance to enable and support the community at risk to protect themselves at any time.

An assembly point could be identified and marked which should be known to all employees. A mock drill should be carried out every six months so that it acts as a training as well as an alertness to the employees.

### e) Coordination with National Agencies

After the 2004 Tsunami affected the Indian sub-continent, the following organizations are involved on watch and cautioning the Government and public in the event of possibility of occurrence of Tsunami. As a part of Tsunami hazard mitigation, warning systems have been established in India by the coordination of the following organizations.

- i) National Disaster Management Authority (NDMA), New Delhi.
- ii) Indian National Centre for Ocean Information Services (INCOIS), Hyderabad.
- iii) Indian Meteorological Department (IMD), New Delhi.

The contact details of International and National agencies are given below.

Organization	Address	Email ID	Contact Number
NDMA	NDMA Bhavan, A-1 Safdarjang Enclave, New Delhi, DL 110029.	<a href="http://www.ndma.gov.in">www.ndma.gov.in</a>	+91 - 11 - 26701700
INCOIS	Ocean Valley, Pragathi Nagar (BO), Nizampet (SO), Hyderabad - 500090	<a href="http://www.incois.gov.in">www.incois.gov.in</a>	+91 - 40 - 23895002
IMD	Mausam Bhavan, Lodi road, New Delhi, DL 110033.	<a href="http://www.imd.gov.in">www.imd.gov.in</a>	+91- 11 - 24699216
IMD	Ahmedabad	079 - 22861413/ 22865012	0278-22867206
IMD	Bhavnagar	-	0278-2209440
GSDMA	Block NO.11, 6 th Floor, Udyog Bhavan, Sector 11, Gandhi Nagar, Gujarat	Email-ceo@gsdma.org info@gsdma.org	(M) 9978405367 (O) 079-23259276, (F) 079-23259275 079 - 23259283 079-23259302
District project officer - GSDMA	Bhavnagar	9824438275	0278-2521554
District Collector,	District Collector Bhavnagar District Opposite Galaxy Cinema, Kalanala, Bhavnagar, Gujarat - 364001	collector- bav@gujarat.gov.in	0278 - 2428822 0278 - 2521666 0278 - 2421881 0278 - 2427756
Mamlatdar (Disaster Management)	Bhavnagar	-	0278 - 2521554 / 2521555 Mob. 8000284545
Gujarat Maritime Board (GMB)	Bhavnagar	-	0278 - 2210221, 2211026
GMB	Head Office, Gandhinagar	-	079 - 23238346-48

Information/ warnings from above agencies should be considered during the operation of port. In case of warnings/high risk, operation shall be suspended and action as per preparedness plan shall be implemented.

## f) Action Plan

Disaster management action can be divided into preventive (pre-incident), during incident and post incident actions. Each disaster, depending upon its intensity would have different extent of damage.

General precautions which are important to face any natural disaster in the site are:

- Employees working in open area shall stay outdoors away from fall objects, falling debris, trees, and power line.
- Disaster related training to staff (basic knowledge on behavior during earthquake, dos and don'ts etc.)
- Precautions such as staying away from buildings, windows and loosely lying materials etc.
- Cutting off the power supply to avoid electric shocks.
- Emergency telephone number should be displayed in the admin house and operational area.
- Vehicle drivers should drive to a clear spot (free from falling objects) and stay in the vehicle.
- Do not walk or drive through flooded area.
- Construction of elevated standing tower of 10 m height at project site.

## i) Cyclone

In case of warning received from India Metrological Department, following action shall be taken immediately:

### Before Cyclone

- Control room shall monitor low pressure formation, cyclone and IMD published details and warnings regularly.
- In case of any warnings, the same shall be reported to onsite disaster management head, HSE and group heads etc.
- Onsite Disaster Management team shall conduct a meeting if possible, immediately after the warning to recollect the management facilities and action to be taken.
- All preparations before the onset of cyclone, actions during cyclone shall be reviewed by the team head.

#### During Cyclone:

- Sound Emergency alarm/siren.
- Inform all staffs about the occurrence of event.
- Stop working/suspend cargo operation.
- Activate incident response team.
- Adequate manpower with tools, welding sets, ropes etc. shall be maintained during cyclone for rescue operation.

After Cyclone: Immediate attending of work area and report damage if any to higher authority. Immediate attending of damages and record should be kept for quick recovery as soon as possible.

#### **ii) Earthquake**

##### During Earthquake:

- Evacuate to safest place by following emergency exist route.
- Hold onto a firm object.
- If outside, stay outside.
- If there is no place to take cover, then move to and brace against an inside wall.

##### After Earthquake:

- Collect report of damages from every division immediately after the event of earthquake.
- Inspection of affected area by Disaster Management Team.
- Procurement of emergency power in case of power failure.
- Inform State and District Management authorities about the damage.
- Take necessary actions for the speedy recovery of operations.

#### **iii) Tsunami**

##### Before Tsunami:

- Control room shall monitor Tsunami warnings from IMD and Indian National Centre for Ocean Information (INCOIS).
- In case of any warnings, the same shall be reported to onsite disaster management head, HSE and group heads etc.
- Make sure all employees know how to respond to a tsunami.
- Flashlight, extra batteries, battery-operated radio, emergency medicines should be kept ready.

##### During Tsunami:

- Listen to a radio to get the latest emergency information and be ready to evacuate.
- Cut down power supply.
- Try to move to elevated ground and stay there for till further information on tsunami.
- Return to workplace only after authorities advise it is safe to do so.

#### After Tsunami:

- Collect report of damages from every division immediately after the event of tsunami.
- Inspection of affected area by Disaster Management Team.
- Procurement of emergency power in case of power failure.
- Inform State and District Management authorities about the damage.
- Take necessary actions for the speedy recovery of operations.

Summary of studies conducted by GSDMA suggest that project area is vulnerable to natural hazards like Cyclone, Storm surge and Earthquake. Implementation of proposed action plan as discussed above and coordination with National & State agency will be the key to address natural disasters.

#### For manmade disasters

##### a) Accidental Barge Collision

Accidental barge collision inside port basin and navigational channel can occur due to piloting error. This can lead to one-to-one barge collision, tug impact, barge hitting against wharf, collision against each other in navigational channel.

Thus, accidental barge collision shall be avoided by

- Ensure proper communication between port control room and barge in charge.
- Clear understanding of timings, positioning, number of barges entering and leaving the basin.
- Clear instruction to barge moving inside the navigational channel.
- Instruction to barge in charge regarding the high tide availability and timings to be followed.
- Development of barge traffic control system in consultation with GMB.

##### b) Fire Accident

Fire accidents at port operational area can occur due to handling/storage/transportation of flammable products or even due to electrical fault. International and National guidelines shall be followed to ensure safety against fire.

- **Fire alarm system**

Fire alarm system will be installed at substation and admin building. The emergency fire alarm shall be initiated by the first person noticing the event/shall be contacted through phone to the control room to take necessary action. HSE department shall ensure that fire alarm system is maintained in a fully operational condition.

- **Firefighting equipment's**

Firefighting equipment's such as fire hydrant and fire extinguisher will be provided. Portable fire extinguisher and fire hydrant system will be placed at port area, Admin building, Substation, Workshop and Canteen area. Clear visibility to these points and sign boards, if necessary, will be provided.

Maintenance of fire alarm and firefighting equipment's will be ensured. Every two months maintenance inspection shall be conducted.

Assembly point shall be identified and detailed fire attending procedure following International and National guidelines shall be developed.

### **Operation Activities Such as Loading/Unloading, Handling and Transportation of Cargoes**

General safety tips to avoid event of accident is outlined below.

- Work inside the wharf area shall be allowed only with work permit.
- Maintain driving speed of 10 kmph at wharf area.
- Do not smoke in the port premises.
- Vehicle shall be parked only in the parking area.
- Do not rest/sleep/climb the stack yard.
- Do not sleep at workplace.
- Do not sleep/rest under vehicle and heaped cargo.
- Do not work under suspended load.
- Use of PPEs in working area shall be ensured.
- Follow First aid first in case of injury.
- Ensure safety rules are followed.
- Do not distract the attention of a worker.
- Follow occupational safety, health, and welfare of workers at workplace as per Gujarat Factories Rules.

#### Unloading from Barges to shore/stackyard

- All employees deployed on board shall wear PPEs.
- No unauthorized person shall be allowed to enter inside operational area.
- All equipment / machines used on board shall conform to the statutory requirement.
- Should be well secured and balanced in the lifting device before load is lifted.
- Unloading equipment should not be loaded beyond its rated load capacity.
- Follow Do's and Don'ts provided in the operation manual of mechanised handling system.
- Spilled over cargo should be cleared immediately.
- Vehicle speed at wharf area shall be 10 kmph.

### Handling and transportation of cargo

- Immediate clearing of spilled over cargo.
- Speed limit of truck/vehicles moving inside port premises should not exceed 10 kmph.
- Use of Personal Protective Equipment's such as safety shoes, helmet etc. shall be made compulsory.
- Vehicle allowed inside the premises of port shall possess Valid Pollution Under Control Certificate.
- Transport Vehicle (Truck) shall not be overloaded, it shall be properly trimmed off and tarpaulin coverage to avoid spillage shall be ensured.
- Don't use mobile phone while driving.

Summary of firefighting measures proposed.

Sl. No	Particular	Fire protection system
1	System provided	
	a) port, admin building, substation, workshop, canteen	Fire hydrant system
	b) port, admin building, substation, workshop, canteen	Fire Extinguisher
	c) Admin building and substation	Fire alarm system
2	Design code	Indian IS code
3	Pumping capacity	171 m <sup>3</sup> /hr. (1 working + 1 standby)
4	Fire water reservoir	175 m <sup>3</sup> x 2 compartments

**Annexure 5 - Advertisement  
and Acknowledgement**



BPIPL/2022/129

07<sup>th</sup> September 2022

To,  
**Municipal Commissioner**  
Bhavnagar Municipal Corporation  
Bhavnagar Mahanagar Seva Sadan,  
Sir Mangal Sinhji Road, Near Kalanala,  
Bhavnagar, Gujarat - 364001.

**Sub: Environment Clearance Accordance for the Development of Brownfield Port at the North Side of Bhavnagar Port (New Port)**

**Ref: Environment Clearance by SEIAA, Gujarat vide letter no. SEIAA/GUJ/EC&CRZ/7(e)/2042/2022 dated 03<sup>rd</sup> September 2022**

Dear Sir,

Bhavnagar Port Infrastructure Private Limited (BPIPL) is in receipt of Environment Clearance & CRZ Clearance for the development of North-side of Bhavnagar Port by BPIPL at Darbari Bhato- GMB Port, Existing Bhavnagar Port vide letter no. SEIAA/GUJ/EC&CRZ/7(e)/2042/2022 dated 03<sup>rd</sup> September 2022.

In accordance with the Clause no. 94 of the Environment Clearance at Ref 1), a copy of the environment clearance to be submitted for information to your good office.

Please find attached copy of Environmental Clearance for your information.

Thanking you,

Yours faithfully,  
For **Bhavnagar Port Infrastructure Private Limited**



**Hitendra Solanki**  
Director  
Encl: As above



**Bhavnagar Port Infrastructure Pvt. Ltd.**

401, 637 Complex, Panchvati 2nd Lane, Gulbai Tekra Road, Ahmedabad - 380006, Gujarat, INDIA  
Phone : +91 79 2964 7277 Website : www.bhavnagarport.in CIN : U45309GJ2019PTC111053 Page 1 of 1



BPIPL/2022/130

07<sup>th</sup> September 2022

To,  
**District Collector**  
Collector office,  
Jilla Seva Sadan,  
Bhavnagar – 364001

**Sub: Environment Clearance Accordance for the Development of Brownfield Port at the North Side of Bhavnagar Port (New Port)**

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Phone : +91 79 2964 7277 Website : www.bhavnagarport.in CIN : U45309GJ2019PTC111053 Page 1 of 1



BPIPL/2022/131

07<sup>th</sup> September 2022

To,  
**Regional Officer**  
Gujarat Pollution Control Board  
1st Floor, Swastik Complex, Plot No. 1616-1617,  
Near Vir Mokhdaji Circle, Ghogha Road,  
Bhavnagar- 364 002.

**Sub: Environment Clearance Accordance for the Development of Brownfield Port at the North Side of Bhavnagar Port (New Port)**

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For **Bhavnagar Port Infrastructure Private Limited**

  
**Hitendra Solanki**  
**Director**  
Enc: As above



**Bhavnagar Port Infrastructure Pvt. Ltd.**

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Phone : +91 79 2964 7277 Website : www.bhavnagarport.in CIN : U45309GJ2019PTC111053 Page 1 of 1



BPIPL/2022/132

07<sup>th</sup> September 2022

To,  
**The Port Officer,**  
Gujarat Maritime Board  
A-1, A-2, Port Colony,  
Opp. Circuit House,  
Waghavadi Road,  
Bhavnagar-364003

**Sub: Environment Clearance Accordance for the Development of Brownfield Port at the North Side of Bhavnagar Port (New Port)**

**Ref: Environment Clearance by SEIAA, Gujarat vide letter no. SEIAA/GUJ/EC&CRZ/7(e)/2042/2022 dated 03<sup>rd</sup> September 2022**

Dear Sir,

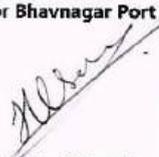
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**Hitendra Solanki**  
**Director**  
Encl: As above



**Bhavnagar Port Infrastructure Pvt. Ltd.**

401, 637 Complex, Panchvati 2nd Lane, Gulbai Tekra Road, Ahmedabad - 380006, Gujarat, INDIA

Phone : +91 79 2964 7277 Website : www.bhavnagarport.in CIN : U45309GJ2019PTC111053 Page 1 of 1

SANDESH

યુનિવર્સિટીના એન્જિનિયરિંગ વિભાગની હાલત ઘણી વધુ સુધારવાની જરૂર છે. યુનિવર્સિટીના એન્જિનિયરિંગ વિભાગની હાલત ઘણી વધુ સુધારવાની જરૂર છે.



યુનિવર્સિટીના એન્જિનિયરિંગ વિભાગની હાલત ઘણી વધુ સુધારવાની જરૂર છે.

મુખ્ય માર્ગમાં ખાડાઓના કારણે અકસ્માતની રહેતી હલેશ વલભીપુર પાલિકાની બેદરકારી : ખાડા ખોદ્યા બાદ કામગીરીમાં થતી આજસ

મારુ રસ્તા, મેઈન બજારમાં રોજ બંધેલાં લોકોની અવર કપાર



મારુ રસ્તા, મેઈન બજારમાં રોજ બંધેલાં લોકોની અવર કપાર

આઈઓની સેપકટરોવ સ્પર્ધામાં તક્ષશિલા કોલેજ ચેમ્પિયન બની



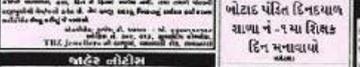
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સ્વામિનારાયણ મંદિર લોખંડ બજારમાં જલક્રીડાની ઉત્સવ



સ્વામિનારાયણ મંદિર લોખંડ બજારમાં જલક્રીડાની ઉત્સવ

કોવાયા ખાતે સિમેન્ટ કોલોની ગણેશ સ્થાપના કરાઈ



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વૈદિક ભરતી

વૈદિક ભરતીની જાહેરાત અને સંબંધિત વિગતો.

જાણી સુખના

જાણી સુખનાની જાહેરાત અને સંબંધિત વિગતો.

ખોટા પૈસા ટિનકાચણ સાથા નં-૧૫ શિક્ષક દિગ્ગજવાણી

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સોમી વાર્ષિક સાધારણ સભા નોટીસ

સોમી વાર્ષિક સાધારણ સભા નોટીસની જાહેરાત.

જાણી સુખના

જાણી સુખનાની જાહેરાત અને સંબંધિત વિગતો.

કર્મચારી સંસ્થાની સુધારણા

કર્મચારી સંસ્થાની સુધારણાની જાહેરાત.

શ્રી તળાજા તાજરિક સહકારી ટેક લિ. તળાજા

શ્રી તળાજા તાજરિક સહકારી ટેક લિ. તળાજાની જાહેરાત.

જાણી સુખના

જાણી સુખનાની જાહેરાત અને સંબંધિત વિગતો.

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જાણી સુખના

જાણી સુખનાની જાહેરાત અને સંબંધિત વિગતો.

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જાણી સુખનાની જાહેરાત અને સંબંધિત વિગતો.

### POWERFUL BUT SIMPLE, NAIVE YET BOLD ART THROUGH AN EXPERT LENS

**Art of India 2022**

**Art of India 2022** is a collection of 100 artworks by artists from across India, showcasing the rich cultural heritage and diverse artistic traditions of the country. The exhibition features a wide range of styles, from traditional folk art to contemporary abstract works.

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### Important for oppn to come together first, says Nitish

**Leader Can Be Decided Later**

Nitish Kumar, leader of the opposition in the Bihar Legislative Assembly, has urged the opposition parties to come together first before deciding on a common leader. He said that the opposition should first focus on presenting a united front against the ruling government.

Nitish said that the opposition parties should first focus on presenting a united front against the ruling government. He said that the opposition should first focus on presenting a united front against the ruling government.

### SALE NOTICE FOR SALE OF IMMOVABLE PROPERTIES

**Regional Office - Rha**  
First Floor, Bharati Building, Colaba Road  
Mumbai - 400 005

Name of the Property	Area	Price	Remarks
1. Plot No. 123, Sector 1, Gurgaon	1000 sq. ft.	100 Lakhs	Commercial plot, ready for construction.
2. Plot No. 456, Sector 2, Gurgaon	1500 sq. ft.	150 Lakhs	Commercial plot, ready for construction.
3. Plot No. 789, Sector 3, Gurgaon	2000 sq. ft.	200 Lakhs	Commercial plot, ready for construction.

**Annexure 6 – NABET & NABL  
Accreditation Certificate**

National Accreditation Board for Education and Training

Certificate of Accreditation

Indomer Coastal Hydraulics (P) Ltd, Chennai

63, Gandhi Road Alwar Thirunagar, Chennai 600 087

The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA/EMP reports in the following Sectors.

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1.	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/sanctuaries/ coral reefs/ecologically sensitive areas including LNG terminal	27	6 (a)	A
2.	Ports, harbours, break waters and dredging	33	7 (e)	A

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated December 15, 2023, posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/24/3104 dated Jan 09, 2024. The accreditation needs to be renewed before the expiry date by Indomer Coastal Hydraulics (P) Ltd, Chennai following due process of assessment.

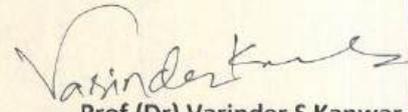
Issue Date  
Jan 09, 2024

Valid up to  
Sept 13, 2026



  
Mr. Ajay Kumar Jha  
Sr. Director, NABET

Certificate No.  
NABET/EIA/23-26/RA 0315

  
Prof (Dr) Varinder S Kanwar  
CEO-NABET





National Accreditation Board for  
Testing and Calibration Laboratories

NABL

**CERTIFICATE OF ACCREDITATION**

**INDOMER COASTAL HYDRAULICS PRIVATE LIMITED**

has been assessed and accredited in accordance with the standard

**ISO/IEC 17025:2017**

**"General Requirements for the Competence of Testing &  
Calibration Laboratories"**

for its facilities at

NO. 63, GANDHI ROAD, ALWAR THIRUNAGAR, CHENNAI, TAMIL NADU, INDIA

in the field of

**TESTING**

Certificate Number: TC-5232

Issue Date: 13/01/2026

Valid Until: 12/01/2030

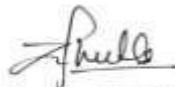
This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.  
(To see the scope of accreditation of this laboratory, you may also visit NABL website [www.nabl-india.org](http://www.nabl-india.org))

Name of Legal Entity: **INDOMER COASTAL HYDRAULICS PRIVATE LIMITED**

Signed for and on behalf of NABL



  
Anita Rani  
Director

  
Dr. Ramanand N. Shukla  
Chief Executive Officer