adani
Ports and Logistics

AECTPL/KPL/HYC/ENV/2021/72

Date: 10.08.2021

To,
The General Manager (Marine Services)
Kamarajar Port Limited,
23, Rajaji Salai, Chennai – 600 001

Dear Sir,

Sub: Development of container terminal at Kamarajar Port Limited on DBFOT basis, KPL awarded to Adani Ennore Container Terminal Private Limited (AECTPL)- **Submission of Half yearly Compliance (January 2021 to June 2021) of Environmental Clearance issued to Kamarajar Port Limited in various stages of development with regards to Container Terminal** – Reg.

Ref: 1. Vide order no: 10-28/2005-IA-III dated 19th May, 2006
2. Vide order no: 10-28/2005-IA-III dated: 10/09/2007 and validity extension date: 31.03/2017
3. Vide order no: 10-28/2005-IA-III dated: 24/12/2014

With reference to the above captioned subject, **Adani Ennore Container Terminal Private Limited** is submitting the **Half yearly compliance report** (for the period **January 2021 to June 2021**) of applicable conditions to the Environmental & CRZ Clearance obtained by the M/s. Kamarajar Port Limited in various stages of development as referred above.

Kindly acknowledge us the receipt of the same.

For M/s. **Adani Ennore Container Terminal Private Limited,**

R. Sathish Kumar
Head - Environment

Encl.: As above.

Adani Ennore Container Terminal Pvt Ltd
Adani House
C/o. Kamarajar Port Limited
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Tamil Nadu- 600 120.

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AECTPL/KPL/HYC/ENV/2021/72 Date: 10.08.2021

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adani Ports and Logistics	Adani Ennore Container Terminal Pvt Ltd	From: January 2021 To : June 2021

Status of Conditions Stipulated in Environmental and CRZ Clearance
File no: 10-28/2005-IA-III dated 19th May, 2006

Half yearly Compliance report on conditions stipulated in Environmental & CRZ Clearance (Period: January 2021 to June 2021)		
S. No.	**Conditions**	**Compliance Status**
SPECIFIC CONDITIONS		
I.	All the conditions stipulated in the NOC from TNPCB vide their letter No. T12/TNPCB/Misc./F.3322/TVLR/05, dated 07.12.2005 should be strictly implemented.	**Status by KPL.** Detailed compliance submitted as annexure by KPL dated 18.07.2013.
II.	Groins and other suitable structures should be constructed to prevent the closing of the month of Ennore Creek.	**Status by KPL.**
III.	The DPR and the technical details to be awarded to the BOT operator should provide to MoEF for post project monitoring within 6 months from the date of receipt of this letter.	**Complied.** Container Terminal DPR submitted vide letter number EPL/MS/49/2008 dt. 13/03/2008.
IV.	The marine terminal should be set up outside CRZ area.	**Status by KPL.**
V.	Recommendations of Risk Analysis report should be strictly implemented and a comprehensive quantitative Risk Analysis should be carried out before operationalizing the project.	**Complied** Operational Risk Assessment carried out and the recommendations are being implemented. Operational Risk Assessment report submitted vide Letter No. AECTPL/KPL/EC-compliance/Env/02 dt. 13.07.2018.
VI.	Approval form Chief Controller of Chief Explosives should be obtained for hazardous chemicals storage, transfer and related activities.	**Not Applicable.** AECTPL is not storing any Hazardous chemicals. Hence not applicable.
VII.	The reclamation of the port area should be carried out with the dredged materials. Dredged material should not be dumped into the sea. No reclamation should be carried outside the port limits.	**Status by KPL.**
VIII.	The coastal protection works should be carried out after detailed hydrodynamic modelling studies and it should be ensured that no erosion or accretion takes place in the shore protection works.	**Status by KPL.**
IX.	Reclamation of 500 acres should be carried out only for the port development. The height of the reclaimed area will be maintained above the maximum flood level.	**Status by KPL.**

Half yearly Compliance report on conditions stipulated in Environmental & CRZ Clearance (Period: January 2021 to June 2021)		
S. No.	**Conditions**	**Compliance Status**
X.	The wave tranquillity study and the ship manuring studies carried out should be taken into account while operating the port.	**Status by KPL.**
XI.	The project proponent should ensure that doing construction and operation of the port there will been impact on the livelihood of the fisherman. The fishermen should be provided free access to carry out the fishing activity.	**Status by KPL.**
XII.	All necessary precaution while undertaking construction and operation of the port should be taken keeping in view the bathymetric changes caused due to tsunami.	**Status by KPL.**
XIII.	All development in the port should be accordance with the Coastal Regulation Zone Notification, 1991 and approved Coastal Zone Management Plan of Tamil Nadu.	**Status by KPL.**
XIV.	The project proponent should undertake a comprehensive hydrodynamic modelling study with regard to river diversion and submit the report to the Ministry within 6 months from the date of receipt of this letter. Further the unit should comply with all the findings/recommendations of the study.	**Status by KPL.**
XV.	Construction labour camps should be located outside of CRZ area and should be provided with adequate cooking and sanitation facilities.	**Complied.** Construction of container terminal is completed and the terminal is under operation
XVI.	The project affected people, of any should be properly compensated and rehabilitated.	**Status by KPL.**

GENERAL CONDITIONS:		
i.	Development of the proposed channel should be undertaken meticulously conforming to the existing Central/Local rules and regulations including CRZ Notification, 1991 and its amendments. All the construction designs/drawings relating to the proposed development activities must have approvals of the concerned State Govt. Depts./Agencies.	**Status by KPL.**
ii.	A well-equipped laboratory with suitable instruments to monitor the quality of air and water shall be set up as to ensure that the quality of ambient air and water conforms to the prescribed standards. The laboratory will also equipped with qualified manpower including a marine biologist so that the marine water quality is regularly monitored in order to ensure that the marine life is not adversely affected as a result of implementation of the said project. The quality of ambient air and water shall be monitored periodically in all the seasons and the results should be properly maintained for inspection of concerned pollution control agencies. The periodic monitoring reports at least once in 6 months must be send to this Ministry (RO at Bangalore) and Pollution Control Committee.	**Complied.** AECTPL has awarded Environmental Monitoring services to NABL accredited laboratory. Marine, Surface Water, Sea Sediment, Ambient Air, Noise monitoring and analysis is carried out on regular basis. The reports are being submitted to KPL and Tamil Nadu Pollution Control Board on monthly basis and also as part of Six monthly compliance report. Monitoring Reports are properly maintained and made available for inspection to Pollution Control Agencies, as and when required. Environment Monitoring report for the period January 2021 – June 2021 is attached as **Annexure - I.**
iii.	Adequate provisions for infrastructure facilities such as water supply, fuel for cooking, sanitation etc. must be provided for the labourers during the construction period in order to avoid damage to the environment. Colonies for the labourers should not be located in CRZ area. It should also be ensured that the construction	**Complied.** Construction completed and terminal is in operation.

	workers do not cut trees including mangroves for fuel wood purpose.	
iv.	To prevent discharge of sewage and other liquid wastes into the water bodies, adequate system for collection and treatment of the waste must be provided. No Sewage and other liquid wastes without treatment should be allowed to enter into the water bodies.	**Complied.** AECTPL has installed and operating 25 KLD capacity Sewage Treatment Plant and entire treated sewage water is being used for horticulture purpose.
v.	Appropriate facility should be created for the collection of solid and liquid wastes generated by the barges/vessels and their safe treatment and disposal should be ensured to avoid possible contamination of the water bodies.	**Status by KPL.**
vi.	Necessary navigational aids such as channel markers should be provided to prevent accidents. Internationally recognized safety standards shall be applied in case of barge/vessel movements.	**Status by KPL.**
vii.	The project authorities should take appropriate community development and welfare measures for villagers in the vicinity of the project site, including drinking water facilities. A separate fund should be allocated for the purpose.	**Status by KPL.** However, AECTPL has implemented CSR activities like General Health Camp, Eye Camp, encouraging sports & events, etc., in the vicinity of the Port area. Expenses incurred for CSR during the compliance period is Rs.147.38 Lakhs. Breakup details are as follows; **S.No** / **Description** / **Amount (Rs in Lakhs)** 1 / Education / 31.20 2 / Health / 27.70 3 / Sustainable Livelihood Development / 32.18 4 / Community Infrastructure Development / 56.30 **Total** / **147.38**
viii.	The quarrying material required for the construction purpose should be obtained only from the approved quarries/borrow areas. Adequate safeguards measures shall be taken	**Complied** Construction is completed and terminal is in operation phase.

	to ensure that the overburden and rocks at the quarry site do not find their way in water bodies.	
ix.	For employing unskilled, semi-skilled and skilled workers for the project, preference should be given to local people.	**Complied.** AECTPL has considered local people during construction phase & also during Operation Phase through Contracts.
x.	The recommendations made in the EMP and DMP, as contained in the EIA and RA reports of the projects shall be effectively implemented.	**Status by KPL.**
xi.	A separate EMC with suitable qualified staff to carry out various environment should be set up under the charge of a Senior Executive who will report directly to Chief Executive of the Company.	**Complied.** A separate EMC with suitable qualified staff has been put in place by AECTPL for taking care of various day-to-day Environmental monitoring compliance and allied activities. Environment Department is headed by Senior Manager – Environment, who is reporting directly to Chief Executive Officer of the company. He is well supported by Environment Management Team at H.O.
xii.	The funds earmarked for environment protection measures should be maintained in a separate account and there should be no diversion of these funds for any other purpose. A year-wise expenditure on environmental safeguards should be reported to this Ministry.	**Complied** Environmental Expenditure carried out during compliance period (January 2021 to June 2021) is Rs. 25.89 Lakhs. The Breakup details are as follows; Sl.No | Description | Amount (Rs. in Lakhs) 1 | Environmental Monitoring | 2.00 2 | Greenbelt | 2.22 3 | STP – O& M | 2.26 4 | Housekeeping | 19.41
xiii.	Full support should be extended to the officers of the Ministry's Regional office at Bangalore and the officer of the Central and SPCB by the project proponent during this inspection for monitoring purposes, by furnishing full details and action plans including the action plans including the action taken reports in respect if mitigative measures and	**Noted for compliance.** TNPCB Officials have visited our Port on monthly basis. There was no visit of officials from RO-MoEF&CC and CPCB during the compliance period. All the necessary support is provided during their site visit.

	other environmental protection activities.	
xiv.	In case there is an intension of deviation or alternation in the project including the implementing agency, a fresh reference should be made to this Ministry for modification in the clearance conditions or imposition of new ones for ensuring environmental protection. The project proponents should be responsible for implementing the suggested safeguard measures.	**Noted for compliance**
xv.	The Ministry reserves right to revoke this clearance, if any of the conditions stipulated are not compiled with to the satisfaction of this Ministry.	**Noted.**
xvi.	This Ministry or any other competent authority may stipulate additional conditions subsequently, if deemed necessary for environmental protection, which shall be complied with.	**Noted for Compliance**
xvii.	The project proponent should advertise at least in two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned available with the SPCB and may also be seen at Website of the Ministry of Environment & Forests at http:www.envforenic.in. The advertisement should be made within 7 days from the date of issue of the clearance letter and a copy of the same should be forwarded to the Regional Office of the Ministry at Bangalore.	**Status by KPL.**
xviii.	The project proponents should inform the RO as well as the Ministry the date of financial closure and final approval of the project by the concerned authorities and the date of start of Land Development Work.	**Status by KPL.**

Vide order no: 10-28/2005-IA-III dated: 10/09/2007 and validity extension date: 31.03/2017

A. SPECIFIC CONDITIONS:

S.No	Environmental Clearance conditions	Compliance Status
i	It should be ensured that no mangroves are destroyed during reclamation.	**Status by KPL.**
ii	The proposed extension to the project should not cause any shoreline change abutting Ennore Port.	**Status by KPL.**
iii	Adequate provision for beach nourishment and sand bypass should be provided.	**Status by KPL.**
iv	The dredged material obtained should be utilized for filling up of back up area.	**Status by KPL.**
v	All conditions stipulated in the environmental clearance letter of even number dated 19.05.2006 should be strictly complied with.	**Complied** All stipulated conditions applicable to AECTPL in the environmental clearance letter of even number dated 19.05.2006 are being complied and compliance reports are regularly submitted to KPL. Last compliance report for the period June 2020 to December 2020 was submitted to KPL vide letter No. AECTPL / KPL / HYC / ENV / 2020 / 38 dated 29.01.2021.
vi	The additional dredged material of 4 million cu. Mts. obtained from the project should not be disposed of into the sea.	**Status by KPL.**
vii	The reclaimed area should be used as containers stack yard only.	**Status by KPL.**
viii	Adequate drainage facilities should be provided in the reclaimed are along with collection and treatment system for treating the run off from the container stack yards.	**Status by KPL.**
ix	Necessary approvals/clearances should be obtained from the Tamil Nadu Coastal Zone Management Authority and Tamil Nadu Pollution	**Complied** TNCZMA recommendation was obtained by KPL Tamil Nadu Pollution Control Board accorded Renewal of Consent to

	Control Board before implementing the project.	Operate orders to handle 11.68 MMTPA containers vide order no: 1808111676581 & 1808211676581 under Air and Water Acts dated: 23/08/2018 valid for 3 years. TNPCB extended the validity period of Consent to Operate (CTO) of units/facility, who have the valid CTO upto March 2021, for a further period upto 30th November 2021 vide their Order No. TNPCB / P&D / F.19205 / 2019 dated 13.05.2021.

B. GENERAL CONDITIONS:

S.No	Environmental Clearance conditions	Compliance Status
i	Construction of the proposed structures should be undertaken meticulously confirming to the existing Central/ local rules and regulations including Coastal Regulation Zone Notification 1991 & its amendments. All the construction design drawings relating to the proposed construction activities must have approvals of the concerned State Government Departments / Agencies.	**Status by KPL.**
ii	Adequate provisions for infrastructure facilities such as water supply, fuel, sanitation etc. should be ensured for construction workers during the construction phase of the project so as to avoid felling of trees/ Mangroves and pollution of water and the surroundings.	**Complied.** Construction of container terminal is completed, and project is in operation phase
iii	The project authorities mush make necessary arrangements for disposal of solid wastes and for the treatment of effluents by providing a proper wastewater treatment plant outside the CRZ area. The quality of treated effluents, solid wastes and noise level etc. must conform to the standards laid down by the competent authorities including the Central/State Pollution Control	**Complied** AECTPL has installed and operating 25 KLD sewage treatment plant to collect and treat the sewage generated from the terminal. The entire treated sewage water is being used for horticulture purpose. AECTPL has implemented Integrated Waste Management System (IWMS) - Waste Segregation Yard.

	Board and the Union Ministry of Environment and Forests under the Environment (Protection) Act, 1986, whichever are more stringent.	All the Solid waste generated is being handled in line to Solid Waste Management Rules, 2016 as amended. AECTPL vision is based on adoption of 5R principle of waste management i.e Reduce, Reuse, Reprocess, Recycle & Recover. All waste is being handled inline to 5R principle.
iv	The proponent shall obtain the requisite consents for discharge of effluents and emission under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 from the Tamil Nadu Pollution control Board before commissioning of the project and a copy of each of these shall be sent to this Ministry.	**Complied** Tamil Nadu Pollution Control Board accorded Renewal of Consent to Operate orders to handle 11.68 MMTPA containers vide order no: 1808111676581 & 1808211676581 under Air and Water Acts dated: 23/08/2018 valid for 3 years. TNPCB extended the validity period of Consent to Operate (CTO) of units/facility, who have the valid CTO upto March 2021, for a further period upto 30th November 2021 vide their Order No. TNPCB / P&D / F.19205 / 2019 dated 13.05.2021.
v	The proponent shall provide for a regular monitoring mechanism so as to ensure that the treated effluents conform to the prescribed standards. The records of analysis reports must be properly maintained and made available for inspection to the concerned State/Central officials during their visits.	**Complied** AECTPL has awarded Environmental Monitoring services to NABL accredited laboratory. Monitoring of Ambient Air Quality, Noise, Stack, STP, Drinking Water, Marine Surface Water, Sea Sediment is carried out on regular basis. The reports are being submitted to KPL and Tamil Nadu Pollution Control Board on monthly basis and also as part of Six monthly compliance report. Environment Monitoring report for the period January 2021 – June 2021 is attached as **Annexure - I.** Reports are made available for inspection to the concerned State/Central officials during their visits.
vi	In order to carry out the environmental monitoring during the operational phase of the project, the	**Complied**

	project authorities should provide an environmental laboratory well equipped with standard equipment and facilities and qualified manpower to carry out the testing of various environmental parameters.	Environmental Monitoring is being carried out through NABL accredited laboratory. Monitoring of Ambient Air Quality, Noise, Stack, STP, Drinking Water, Marine Surface Water, Sea Sediment is carried out on regular basis. The reports are being submitted to KPL and Tamil Nadu Pollution Control Board on monthly basis and also as part of Six monthly compliance reports. Environment Monitoring report for the period January 2021 – June 2021 is attached as **Annexure - I.**
vii	The sand dunes and mangroves, if any, on the site should not be disturbed in any way.	**Status by KPL.**
viii	A copy of the clearance letter will be marked to the concerned Panchayat/Local NGO, if any from whom any suggestion/representation has been received while processing the proposal.	**Status by KPL.**
ix	The Tamil Nadu Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industries Centre and Collector's Office/Tehsildar's Office for 30 days.	**Status by KPL.**
x	The funds earmarked for environment protection measures should be maintained in a separate account and there should be no diversion of these funds for any other purpose. A year wise expenditure on environmental safeguards should be reported to this Ministry's Regional Office at Bangalore and the State Pollution Control Board.	**Complied** Environmental Expenditure carried out during compliance period (January 2021 to June 2021) is Rs. 25.89 Lakhs. The Breakup details are as follows; Sl.No | Description | Amount (Rs. in Lakhs) 1 | Environmental Monitoring | 2.00 2 | Greenbelt | 2.22 3 | STP – O& M | 2.26 4 | Housekeeping | 19.41
xi	Full support should be extended to the officers of this Ministry's Regional office at Bangalore and the officers of the Central and State Pollution Control Boards by the	**Noted for compliance.** TNPCB Officials have visited our Port on monthly basis. There was no visit of officials from RO-MoEF&CC and CPCB

	project proponents during their inspection for monitoring purposes, by furnishing full details and action plans including the action taken reports in respect of mitigative measures and other environmental protection activities.	during the compliance period. All the necessary support is provided during their site visit.
xii	In case of deviation or alteration in the project including the implementing agency, a fresh reference should be made to this Ministry for modification in the clearance conditions or imposition of new ones for ensuring environmental protection.	**Noted.**
xiii	This Ministry reserve the right to revoke this clearance, if any of the conditions stipulated are not complied with to the satisfaction of this Ministry.	**Noted.**
xiv	This Ministry or any other component authority may stipulate any other additional conditions subsequently, if deemed necessary, for environmental protection, which shall be complied with.	**Noted.**
xv	The project proponent should advertise at least in two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned informing that the project has been accorded environmental clearance and copies of clearance letters are available with the State Pollution Control Board and may also be seen at Website of the Ministry of Environment & Forests at http://www.envfornic.in. The advertisement should be made within 7 days from the date of issue of the clearance letter and a copy of the same should be forwarded to the regional Office of this Ministry at Bangalore.	**Status by KPL.**

xvi	The Project proponents should inform the Regional Office at Bangalore as well as the Ministry the date of financial closure and final approval of the project by the concerned authorities and the date of start of Land Development Work.	**Status by KPL.**

Vide order no: 10-28/2005-IA-III dated: 24/12/2014

A. SPECIFIC CONDITIONS:

S.No	Environmental Clearance conditions	Compliance Status
i	"Consent to Establish" for the present project, shall be obtained from State Pollution Control Board under Air (Prevention and Control of Pollution) Act, 1981 and Water (Prevention and Control of Pollution) Act 1974.	**Complied.** Kamarajar Port Limited have obtained "Consent to Establish" from Tamil Nadu Pollution Control Board (TNPCB) for handling container cargo of 16.8 MMTPA vide their Consent Order No. 170126235691 (Air Act) and 170116235691 (Water Act) dated 21.04.2017 valid till 31.03.2024. Tamil Nadu Pollution Control Board accorded Renewal of Consent to Operate orders to handle 11.68 MMTPA containers vide order no: 1808111676581 & 1808211676581 under Air and Water Act dated: 23/08/2018 valid till 31st March 2021. TNPCB extended the validity period of Consent to Operate (CTO) who have the valid CTO upto March 2021, for a further period upto 30th November 2021 vide their Order No. TNPCB / P&D / F.19205 / 2019 dated 13.05.2021.
ii	Quality of Cargo should be handled in accordance with the details provided in the Form-I.	**Complied.** AECTPL is handling only containerized cargo, as approved.
iii	All the recommendations and conditions stipulated by Tamil Nadu Coastal Zone Management Authority (TNCZMA) No. 30060/EC.3/2005-1 dated 06.12.2005 shall be complied with.	**Status by KPL.**

iv	All the conditions as prescribed in the earlier Clearance letter no. 10-28/2005-IA-III dated 19.05.2006 and 10.09.2007 shall be complied with.	**Status by KPL.**
v	All the recommendation of the EIA/EMP & Risk Assessment and Disaster Management Report shall be complied with letter and spirit. All the mitigation measures submitted in the EIA report shall be prepared in the matrix format and the compliance for each mitigation plan shall be submitted to MoEF & CC along with half yearly compliance report to MoEF&CC- RO.	**Status by KPL.**
vi	The commitment made by the proponent to the issue raised during Public Hearing shall be implemented by the Proponent.	**Status by KPL.**
vii	Corporate Environmental Responsibility: a. The Company shall have a well laid down Environmental Policy approved by the Board of Directors. b. The Environment Policy shall prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions. c. The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished. d. To have proper checks and balances, the company shall have a well laid down system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large.	AECTPL having approved QHSE policy. AECTPL having approved SOPs. **Status by KPL.** Standard procedures are available to address corrective & preventive deviation and violations.

B. GENERAL CONDITIONS:

S.No	Environmental Clearance conditions	Compliance Status
i	Appropriate measures must be taken while undertaking digging activities to avoid any likely degradation of water quality.	**Complied** Construction completed and project is under operation.
ii	Full support shall be extended to the officers of the Ministry/Regional Office at Chennai by the project proponent during inspection of the project for monitoring purposes by furnishing full details and action plan including action taken reports in respect of mitigation measures and other environmental protection activities.	**Noted for compliance.** TNPCB Officials have visited our Port on monthly basis. There was no visit of officials from RO-MoEF&CC and CPCB during the compliance period. All the necessary support is provided during their site visit.
iii	A six-Monthly monitoring report shall be need to be submitted by the project proponents to the Regional Office of this Ministry at Chennai regarding the implementation of the stipulated conditions.	**Status by KPL.**
iv	Ministry of Environment, Forests & Climate Change or any other competent authority may stipulate any additional conditions or modify the existing ones, if necessary in the in the interest of environment and the same shall be complied with.	**Noted for compliance.**
v	The Ministry reserves the rights to revoke this clearance if any of the conditions stipulated are not complied with satisfaction of the Ministry.	**Noted.**
vi	In the event of a change in project profile or change in the implementation agency, a fresh reference shall be made to the Ministry of Environment, Forests & Climate Change.	**Noted.**
vii	The project proponents shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of land development work.	**Noted.**
viii	A copy of the clearance letter shall be marked to concerned Panchayat/ Local NGO, if any, from whom any suggestion/	**Status by KPL.**

<table>
<tr><td></td><td>representation has been made received while processing the proposal.</td><td></td></tr>
<tr><td>ix</td><td>The project proponent shall set up separate environmental management cell for effective implementation of the stipulated environmental safeguards under the supervision of a Senior Executive.</td><td>Complied.
A separate EMC with suitable qualified staff has been put in place by AECTPL for taking care of various day to day Environmental monitoring, compliance and allied activities. Environment Department is headed by Senior Manager – Environment, reporting directly to Chief Executive Officer. EMC is well supported by Environment Management Cell, HO.</td></tr>
<tr><td>x</td><td>The funds earmarked for environment management plan shall be included in the budget and this shall not be diverted for any other purposes.</td><td>Complied

Environmental Expenditure carried out during compliance period (January 2021 to June 2021) is Rs. 25.89 Lakhs. The Breakup details are as follows;

<table>
<tr><th>Sl.No</th><th>Description</th><th>Amount (Rs. in Lakhs)</th></tr>
<tr><td>1</td><td>Environmental Monitoring</td><td>2.00</td></tr>
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<tr><td>4</td><td>Housekeeping</td><td>19.41</td></tr>
</table>
</td></tr>
<tr><td>5.</td><td>These stipulations would be enforced among others under the provisions of Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability (Insurance) Act, 1991 and EIA Notification 1994, including the amendments and rules made thereafter.</td><td>Noted.</td></tr>
<tr><td>6.</td><td>All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire Department, Civil Aviation Department, Forest conservation Act, 1980 and Wildlife (Protection) Act,1972 etc. shall be obtained, as applicable by project proponents from the respective competent authorities.</td><td>Noted.</td></tr>
<tr><td>7.</td><td>The project proponent shall advertise at least in two local newspapers widely circulated in the region around the</td><td>Status by KPL.</td></tr>
</table>

	project, one of which shall be in the vernacular language of the locality concerned informing that the project has been accorded Environmental and CRZ clearance and copies of clearance letters are available with the Tamil Nadu State Pollution Control Board and may also be seen at Website of the Ministry of Environment, Forests and Climate Change at http://www.envfornic.in. The advertisement should be made within Seven days from the date of issue of the clearance letter and a copy of the same should be forwarded to the regional Office of this Ministry at Chennai.	
8.	The clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) No. 460 of 20014 as may be applicable this project.	**Noted.**
9.	Any appeal against this clearance shall lie with the National Green Tribunal, if preferred, with a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act 2010.	**Noted.**
10.	Status of compliance to the various stipulated environment conditions and environmental safeguards will be uploaded by the project proponent in its website.	**Complied.** The compliance to the various conditions stipulated for environmental safeguards are uploaded in our Company website and KPL website. https://www.adaniports.com/Downloads and http://ennoreport.gov.in/content/innerpage/environment.php
11.	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zilla Parisad /Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the company by the proponent.	**Status by KPL.**

12.	The proponent shall upload the status of compliance of the stipulated Clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Reginal Office of MoEF, the respective Zonal Office of CPCB and the SPCB.	**Status by KPL.** The compliance to the various conditions stipulated for environmental safeguards are uploaded in our Company website and KPL website.
13.	The project proportion shall also submit six monthly reports on the status of compliance of the stipulated Clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB.	**Status by KPL.**
14.	The Environmental Statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of Clearance conditions and shall also be sent to the respective Reginal Office of MoEF & CC by email.	**Complied.** Environment Statement (Form V) submitted FY 2019-20 vide our Letter No. AECTPL/TNPCB/2019-20/28 dated 21.09.2020 is enclosed as **Annexure – II.**

Enclosures:

Annexure Number	Details of Annexure
Annexure I:	Environmental Monitoring reports for the period January 2021 to June 2021
Annexure II:	Environmental Statement – Form V for the FY 2019-20

REPORT ON

COMPREHENSIVE ENVIRONMENTAL MONITORING FOR

ADANI ENNORE CONTAINER TERMINAL PRIVATE LIMITED (AECTPL)
(WITHIN KAMARAJAR PORTLIMITED)
VALLUR POST, PONNERI TALUK,
CHENNAI -600120

JANUARY 2021 - JUNE 2021

PREPARED BY:

Green Chem Solutions Pvt. Ltd.
No.883, 11th Street,
Syndicate Bank Colony,
Anna Nagar West Extension,
Chennai - 600 101.

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List of Figures

I. INTRODUCTION

M/s. Adani Ennore Container Terminal Pvt Ltd (AECTPL) located inside Kamarajar Port, Ennore is operating container berth and handling containerized Import/Export cargoes.

AECTPL have engaged M/s. Green Chem Solutions (P) Ltd, an Accredited Consultant by NABL to carry out the Comprehensive Environmental monitoring studies in the Adani Ennore Port continuously as per the statutory requirement. This report covers the monitored environmental data for the month of January 2021 to June 2021.

II. LOCATION OF THE PROJECT

The Project site is located at Port area, Ennore Port Area.

The location map is shown in Fig - 1

Fig – 1 – Location Map

III. SCOPE OF WORK

The scope of Comprehensive Environmental monitoring includes the following environmental components

1. Meteorological data
2. Ambient Air Quality
3. Ambient Noise Level
4. Marine Sampling
5. Treated STP Water
6. Potable water
7. DG Set emission

The parameters covered under the scope for each of the above attributes are given below:

SCOPE OF WORK

S.No	Attribute	Scope	Frequency
1.	Meteorological Data	Collection of micrometeorological data on hourly basis by installing an auto weather monitoring station at plant site covering the following parameters : • Wind speed • Wind direction • Rainfall • Relative Humidity • Temperature • Barometric pressure • Solar Radiation	Daily
2.	Ambient Air Quality	Sampling of ambient air at 03 stations for analyzing the following parameters: • PM10 • PM2.5 • SO_2 • NO_2 • CO • Lead • Ozone • Ammonia • Benzene • Benzo Pyrene • Arsenic • Nickel	Weekly Twice
3.	Ambient Noise	Collection of Noise levels on hourly basis at 3 locations • L_{eq} – Day (Max and Min) • L_{eq} – Night (Max and Min)	Monthly Once
4.	Marine Sampling		

4a.	Surface and Bottom Water	Collection of Surface and Bottom Water analyzed for - 2 location • Temperature • pH @ 25°C • Total Suspended Solids • BOD at 27 ºC for 3 days • Dissolved oxygen • Salinity at 25 ºC • Oil & Grease • Nitrate as No_3 • Nitrite as No_2 • Ammonical Nitrogen as N • Ammonia as NH_3 • Kjeldahl Nitrogen as Nl • Total phosphates as PO_4 • Total Nitrogen, • Total Dissolved Solids • COD • Total bacterial count, • Coliforms • Escherichia coli • Salmonella • Shigella • Vibrio cholera • Vibrio parahaemolyticus • Enterococci • Colour • Odour • Taste • Turbidity • Calcium as Ca • Chloride as Cl • Cyanide as CN • Fluoride as F • Magnesium as Mg • Total Iron as Fe • Residual Free Chlorine • Phenolic Compounds as $C_6 H_5 OH$ • Total Hardness as $CaCO_3$ • Total Alkalinity as $CaCO_3$ • Sulphide as H_2S • Sulphate as SO_4 • Anionic surfactants as MBAS • Monocrotophos • Atrazine • Ethion • Chiorpyrifos • Phorate • Mehyle parathion • Malathion • DDT (o,p and p,p-Isomers of • DDT,DDE and DDD • Gamma HCH (Lindane) • Alppha HCH • Beta HCH	Monthly Once

		• Delta HCH • Endosulfan (Alpha,beta and sulphate) • Butachlor • Alachlor • Aldrin/Dieldrin • Isoproturon • 2,4-D • Polychlorinated Biphenyls(PCB) • Polynuclear aromatic • hydrocarbons (PAH) • Arsenic as As • Mercury as Hg • Cadmium as Cd • Total Chromium as C • Copper as Cu • Lead as Pb • Manganese as Mn • Nickel as Ni • Selenium as Se • Barium as Ba • Silver as Ag • Molybdenum as Mo • Octane • Nonane • Decane • Undecane • Tridecane • Tetradecane • Pentadecane • Hexadecane • Heptadecane • Octadecane • Nonadecane • Elcosan	
4b.	Sea Sediment	Collection of sea sediment analyzed for - 2 location • pH • Organic Matter • Moisture Content • Conductivity • Iron • Sodium • Copper • Nickel • Zinc • Manganese • Lead • Boron • Phosphate • Chloride • Sulphate • Sulphide • Pesticide • Potassium	Monthly Once

		• Total Chromium • Petroleum Hydrocarbon • Aluminium • Total Nitrogen • Organic Nitrogen • Phosphorus • Texture	
4c.	Phytoplankton Monitoring	• Total Count • No. of species • Chlorophyll-a • Major Species	Monthly Once
4d.	Zooplankton Monitoring	• Total Count • No. of species • Major	Monthly Once
4e.	Microbiological Monitoring	• Total Bacteria count • Total Coliform • Faecal Coliform • E.Coli • Enterococcus • Salmonella • Sheigella • Vibrio	Monthly Once
4f.	Primary Productivity Monitoring	• Gross primary productivity • Net Primary productivity	Monthly Once
4g.	Phytobenthos Monitoring data	• Fungus • Total Count • No. of species • Diversity Index • Major species	Monthly Once
4h.	Total Fauna Monitoring	• Name of phylum • Class • Number of Individuals encountered • Total no. of species encountered • Total fauna	Monthly Once
5.	STP Treated Water	Collection of STP Treated water analyzed for – 1 locations • pH • TSS • BOD • Faecal Coliforms	Monthly Once
6.	Potable Water analysis	Collection of Drinking water analyzed for – 1 locations - As per IS 10500 2012 – 36 Parameters	Monthly Once
7	DG Set Emissions	Sampling of Emission at 03 stations for analyzing the following parameters: • PM • Carbon Monoxide • NO_x – NO_2 • SO_2	Monthly Once

IV. METHODOLOGY

Methodologies adopted for sampling and analysis for each of the above parameters are detailed below

1	**Meteorological parameters**	
	Auto weather station	
2	**Ambient Air Quality**	
	Parameters	**Method**
	Respirable Suspended Particulate Matter (PM10)	IS 5182 Part 23 : 2006
	Particulate Matter PM2.5	GCS/Lab/SOP/087, CPCB Guidelines
	Sulphur dioxide as SO_2	IS 5182 Part 2 : 2001 (Reaff. 2006)
	Oxides of Nitrogen as NO_2	IS 5182 Part 6 : 2006
	Lead as Pb	IS 5182 Part 22 : 2004 (Reaff.2009)
	Arsenic as As	GCS/Lab/SOP/089, CPCB Guidelines
	Nickel as Ni	GCS/Lab/SOP/090, CPCB Guidelines
	Carbon monoxide as CO	IS 5182 Part 10: 1999 (Reaff. 2009]
	Ozone as O_3	IS 5182 Part 9 : 1974 [Reaff.2009]
	Ammonia as NH_3	GCS/Lab/SOP/086, CPCB Guidelines
	Benzene (α) pyrene	IS 5182 – Part 12
	Benzene as C_6H_6	IS 5182 Part 11 : 2006
3	**Ambient Noise Monitoring**	
	L_{eq} Day & Night	Instrument Manual, GCS/LAB/SOP/Noise/001
4	**Marine Sampling**	
	Surface and Bottom Water	APHA Methods 23rd Edition, 2017 Standard Methods for examination of Water and Waste water and IS 3025 & USEPA Test Methods
	Sea Sediment	
	Phytoplankton Monitoring	
	Zooplankton Monitoring	
	Microbiological Monitoring	
	Primary Productivity Monitoring	
	Phytobenthos Monitoring data	
	Total Fauna Monitoring	
5	**STP Water Analysis**	
	pH , TSS, BOD , Faecal Coliforms	APHA Methods 23rd Edition, 2017 Standard Methods for examination of Water and Waste water and IS 3025
6	**Drinking Water Analysis**	
	As per IS 10500 : 2012 – 36 Parameters	APHA Methods 23rd Edition, 2017 Standard Methods for examination of Water and Waste water and IS 3025
7	**Emission Monitoring**	
	PM, Carbon Monoxide, NO_x – NO_2, SO_2	IS 11255 Methods of measurement of emissions from Stationary source

V. ENVIRONMENTAL STUDIES – January 2021 to June 2021

S.No	ATTRIBUTE	SCOPE
1.	Meteorological parameters	Collection of micrometeorological data at project site on daily basis with hourly frequency
2.	Ambient Air Quality	Collection of ambient air at 3 locations.
3.	STP water	Collection of STP Inlet & outlet water at one location
4.	Ambient Noise	Collection of Ambient noise levels for day and night at 3 locations
5.	Potable Water	Collection of Potable water at Canteen Building
6.	Marine Water and Marine Sediments	Collection of Marine water and Marine Sediments at One locations
7	DG Set Emissions	Collection of DG Set Emission at 4 locations.

i. METEOROLOGICAL DATA

Meteorological data was collected on hourly basis by installing an auto weather monitoring station at Plant site. The report depicted here under represents the data for January 2021 to June 2021. The Detailed report has been is enclosed as Annexure - 1

The following parameters were recorded

- Wind speed
- Wind direction
- Temperature
- Pressure
- Relative humidity
- Rainfall

Annexure - 1

Jan - 2021

Marine Infrastructure Developer Pvt Ltd

Report Type:Average Report

From: 01-01-2021 00:00:00 To: 31-01-2021 23:59:59

Created By: glensAdmin Created At: 2021-02-05 11:27:48

Date-(DD-MM-YYYY)	Wind Speed (km/h)	Wind Direction (Degree)	Atm Temperature (Degree C)	Relative Humidity (%)	Total Rainfall (mm)	Atm Pressure (mBar)	Solar Radiation (w/m2)
01-01-2021	7.74	69.12	29	82	0	1009.45	3.54
02-01-2021	8.33	67.91	28.35	95.38	0	1009.28	1.15
03-01-2021	7.82	75.53	28.76	96.81	0	1007.89	2.39
04-01-2021	8.41	63.93	28.88	94.95	0.09	1008.19	3.18
05-01-2021	5.28	101.12	27.51	99.9	31.94	1008.73	0.65
06-01-2021	3.1	94.08	28.54	99.83	5.48	1007.67	3.23
07-01-2021	3.99	143.29	27.88	99.84	35.33	1006.77	3.06
08-01-2021	2.94	169.89	27.57	99.81	1.06	1006.38	1.92
09-01-2021	4.81	77.39	28.88	98.81	0	1006.91	3.78
10-01-2021	8.01	57.8	28.96	99.74	0	1007.4	3.09
11-01-2021	9.85	67.26	29.12	99.13	0	1008.15	4.41
12-01-2021	11.45	59.99	28.92	98.53	0	1008.34	3.82
13-01-2021	7.85	54.08	29.24	94.63	0	1008.36	4.32
14-01-2021	7.37	64.47	29.24	96.12	0	1007.89	3.9
15-01-2021	5.24	71.08	29.34	84.46	0	1007.64	4.31
16-01-2021	4.49	70.72	28.99	82.39	0	1007.03	4.72
17-01-2021	4.4	118.67	28.47	78.16	0	1008.28	4.94
18-01-2021	5.35	75.31	29.32	75.27	0	1008.87	4.7
19-01-2021	7.68	68.05	29.01	82.43	0	1008.47	4.51
20-01-2021	5.88	106.66	28.48	94.73	0	1008.98	2.87
21-01-2021	3.76	115.84	29.08	98.79	0	1008.36	4.66
22-01-2021	3.29	157.08	29.18	94.77	0	1008.38	4.26
23-01-2021	3.84	87.1	29.41	86.27	0	1008.69	4.86
24-01-2021	4.28	147.86	28.32	89.9	0	1009.39	4.71
25-01-2021	3.98	117.11	28.81	84.94	0	1009.96	4.81
26-01-2021	4.01	137.29	28.76	80.08	0	1009.4	5.01
27-01-2021	3.39	134.19	28.28	84.54	0	1009.61	4.35
28-01-2021	6.12	83.9	29.7	82.43	0	1009.69	4
29-01-2021	6.44	85.47	29.89	81.38	0	1010.04	4.43
30-01-2021	5.25	80.61	29.62	85.61	0	1009.53	4.66
31-01-2021	5.5	78.85	29.48	85.93	0	1010.06	4.78

Feb - 2021

Date	Ambient Temperature (°C)			Atmospheric Pressure (mbar)			Predominant wind Direction (Blowing From)	Wind Speed (m/s)			Relative Humidity (%)			Rainfall mm
	Min	Max	Avg	Min	Max	Avg		Min	Max	Avg	Min	Max	Avg	
01.02.21	25.9	28.6	27.2	1012.8	1017.2	1014.7	NNE	0	1.8	0.8	72	81	77.1	0.0
02.02.21	26.3	29.4	27.5	1012.9	1016.9	1014.8	N	0	2.2	0.6	73	82	78.1	0.6
03.02.21	25.9	28.2	26.9	1012.7	1016.7	1014.4	N	0	1.8	0.8	68	78	72.5	0.0
04.02.21	23.5	28.6	26.7	1012.5	1016.8	1014.3	NE	0	0.9	0.4	61	85	69.3	0.0
05.02.21	21.5	28.4	26.0	1011.2	1015.7	1013.4	N	0	2.7	0.6	62	87	70.1	0.0
06.02.21	21.2	28.3	25.9	1010.5	1014.2	1012.3	N	0	0.9	0.4	67	90	73.9	0.0
07.02.21	21	28.3	25.1	1011	1014.8	1012.7	N	0	2.2	0.6	72	92	80.5	0.0
08.02.21	24.8	28.6	26.7	1011.8	1015.6	1013.6	N	0	1.3	0.5	68	79	73.8	0.0
09.02.21	25.8	29.4	27.0	1011	1015.5	1012.9	N	0	0.9	0.4	59	84	68.5	0.0
10.02.21	24.7	28.3	26.4	1009.8	1014.4	1012.0	N	0	0.4	0.2	62	76	69.5	0.0
11.02.21	21.1	27.3	25.5	1009.5	1013.7	1011.6	E	0	0.9	0.2	64	89	71.1	0.0
12.02.21	21.4	28.7	25.9	1010.6	1014.1	1012.2	N	0	0.9	0.3	61	83	69.6	0.0
13.02.21	21.4	27.8	25.3	1011.8	1015	1013.2	N	0	1.3	0.4	71	86	77.7	0.0
14.02.21	21.1	28	25.6	1011.2	1014.9	1013.1	N	0	0.9	0.3	64	91	77.3	0.0
15.02.21	21.6	28.1	25.3	1009.5	1013.9	1012.0	N	0	0.9	0.3	71	91	79.8	0.0
16.02.21	20.8	27.6	25.5	1009.3	1013.7	1011.4	N	0	1.3	0.4	74	92	79.2	0.0
17.02.21	22.1	29	27.2	1009.1	1015	1012.4	E	0	1.8	1.0	69	80	73.1	0.0
18.02.21	26.1	29	27.2	1010.8	1015	1012.4	N	0.4	1.8	1.0	70	80	73.1	0.0
19.02.21	23.9	28.6	26.4	1010.6	1014.9	1012.6	N	0	2.7	1.0	79	90	83.8	0.4
20.02.21	22.9	27.8	25.5	1010.8	1014.6	1012.7	N	0	3.6	1.7	78	93	84.5	0.0
21.02.21	24.9	27.6	26.3	1011.3	1015.3	1013.2	N	0.4	2.2	1.3	78	88	83.6	0.0
22.02.21	24.4	28.7	27.1	1011.6	1015.6	1013.2	N	0	0.9	0.4	77	93	83.2	0.0
23.02.21	23	28.9	26.6	1009.6	1014.8	1011.9	N	0	0.9	0.3	76	94	83.3	0.0
24.02.21	22.6	28.7	26.2	1009.1	1013.1	1011.1	N	0	1.3	0.3	70	95	81.8	0.0
25.02.21	22	28.1	26.0	1008.7	1013.7	1010.8	N	0	2.7	0.7	75	93	81.9	0.0
26.02.21	22.4	27.8	25.8	1006.5	1012.1	1009.2	ESE	0	2.7	1.3	80	94	85.8	0.0
27.02.21	22.2	27.9	25.7	1006.1	1010.7	1008.3	SE	0	3.6	1.9	81	97	88.2	0.0
28.02.21	22.6	27.1	25.5	1007	1011.9	1009.3	N	0	3.1	1.5	83	97	89.1	0.0

Mar - 2021

Date	Ambient Temperature (°C)			Atmospheric Pressure (mbar)			Predominant wind Direction (Blowing From)	Wind Speed (m/s)			Relative Humidity (%)			Rainfall mm
	Min	Max	Avg	Min	Max	Avg		Min	Max	Avg	Min	Max	Avg	
01.03.21	22	28.2	26.0	1009.8	1014.1	1012.0	N	0	3.6	2.1	81	97	87.2	0.0
02.03.21	23.2	28.2	26.2	1010.4	1014.5	1012.4	N	0.4	3.1	1.8	79	95	85.8	0.0
03.03.21	22.2	27.7	25.9	1009.9	1013.3	1011.5	ESE	0	2.7	1.0	73	93	83.5	0.0
04.03.21	22.3	28.1	26.0	1010.6	1013.8	1012.0	N	0	2.7	0.9	72	93	80.4	0.0
05.03.21	22.2	28.8	26.3	1010.7	1015	1012.7	N	0	2.7	0.8	74	92	81.5	0.0
06.03.21	23.2	28	26.2	1009.8	1014.8	1012.1	N	0	3.1	1.6	79	92	85.3	0.0
07.03.21	23.8	28.4	26.7	1008.8	1013.6	1011.3	N	0	3.6	1.9	79	94	86.6	0.0
08.03.21	24	29.2	27.3	1009.9	1014.5	1011.9	N	0	3.1	1.4	77	95	83.6	0.0
09.03.21	25.2	29.6	28.0	1010.7	1014.6	1012.5	E	0	2.7	0.9	78	92	82.9	0.0
10.03.21	27.1	29.9	28.2	1009.5	1014.6	1012.2	N	0.4	3.1	1.6	79	87	83.9	0.0
11.03.21	25.1	28.6	27.5	1009.2	1014.8	1012.1	N	0	3.6	2.4	79	91	82.6	0.0
12.03.21	23.4	28.8	26.8	1011.5	1016.1	1013.4	ESE	0	3.1	1.5	74	95	82.1	0.0
13.03.21	22.7	29.5	27.0	1010.9	1015.5	1012.8	ENE	0	1.3	0.7	75	93	81.4	0.0
14.03.21	23.4	29.4	27.2	1008.8	1013.4	1011.1	N	0	2.2	1.2	68	93	82.0	0.0
15.03.21	23.8	29.7	27.3	1008.3	1012.5	1010.2	N	0	1.8	0.5	76	94	84.9	0.0
16.03.21	24	29.1	27.1	1008.5	1012.3	1010.2	N	0	2.2	0.7	79	95	85.6	0.0
17.03.21	23.4	29.3	27.5	1007.7	1011.7	1009.7	ESE	0	1.3	0.3	79	93	80.4	0.0
18.03.21	24.3	29.3	27.5	1008	1011.7	1009.7	ESE	0	1.3	0.3	72	93	80.4	0.0
19.03.21	24.4	28.9	27.5	1007.3	1012	1009.4	N	0	3.1	0.9	74	87	79.3	0.0
20.03.21	23.4	28.9	26.7	1006.2	1010.4	1008.3	ESE	0	2.7	0.8	78	93	85.2	0.0
21.03.21	23.6	29.9	27.5	1006	1009.8	1007.8	ESE	0	0.9	0.3	75	95	84.0	0.0
22.03.21	25.2	29.6	27.9	1007.1	1011.9	1009.3	ESE	0	3.1	1.2	77	92	82.8	0.0
23.03.21	24.7	30.3	28.3	1008.4	1012.4	1010.3	ESE	0	1.8	0.4	75	92	81.2	0.0
24.03.21	24.4	30.5	28.1	1007.7	1012.9	1010.2	ENE	0	0.4	0.1	77	93	84.5	0.0
25.03.21	24.7	29.4	27.8	1007	1011.3	1009.1	ESE	0	1.8	0.4	80	95	87.3	0.0
26.03.21	25.1	29.8	28.1	1006.1	1011.1	1008.4	E	0	3.1	0.6	80	95	86.4	0.0
27.03.21	25.4	29.3	28.0	1005.9	1010.4	1008.0	ESE	0	3.1	1.1	79	94	86.2	0.0
28.03.21	25.3	29.9	28.1	1004.7	1009.5	1007.5	SE	0	3.6	1.9	82	93	87.0	0.0
29.03.21	27	29.9	28.7	1004.6	1009.3	1007.1	SSE	0.4	3.6	2.6	84	93	88.1	0.0
30.03.21	27.8	34.1	29.4	1001.7	1007.9	1005.2	SE	0.4	3.6	2.6	67	94	84.7	0.0
31.03.21	27.8	30.2	29.0	1000.3	1005.7	1003.2	SSE	0.9	4.5	3.1	81	94	88.6	0.0

Apr - 2021

Marine Infrastructure Developer Pvt Ltd

Report Type:Average Report

From: 01-04-2021 00:00:00 To: 30-04-2021 23:59:59

Created By: glensAdmin Created At: 2021-05-04 10:05:05

Date-(DD-MM-YYYY)	Wind Speed (km/h)	Wind Direction (Degree)	Atm Temperature (Degree C)	Relative Humidity (%)	Total Rainfall (mm)	Atm Pressure (mBar)	Solar Radiaton (w/m2)
Avg	3.98	212.85	32.35	91.71	0.22	1005.29	249.39
Min	2.98	159.54	30.11	84.77	0	1000.23	146.97
Max	5.9	244.05	33.59	96.49	6.62	1008.16	284.67
01-04-2021	5.1	228.11	32.79	92.35	0	1000.23	227.78
02-04-2021	5.77	215.08	33.59	86.09	0	1000.41	223.52
03-04-2021	5.9	224.42	32.64	91.62	0	1001.76	229.42
04-04-2021	3.92	202.17	32.39	96.49	0	1003.62	194.55
05-04-2021	4.69	164.52	32.16	95.03	0	1005.07	246.27
06-04-2021	3.29	187.64	31.8	89.88	0	1006.42	236.77
07-04-2021	3.47	240.33	31.71	89.21	0	1006.86	228.68
08-04-2021	4.61	239.21	31.21	89.3	0	1005.28	236.78
09-04-2021	4.12	228.94	31.38	84.77	0	1005.12	236.12
10-04-2021	4.06	198.76	31.56	88.27	0	1006.65	274.66
11-04-2021	4.39	159.54	31.72	91.83	0	1007.96	271.9
12-04-2021	3.66	193.23	32.61	88.01	0	1008.16	269.83
13-04-2021	3.7	201.6	32.36	89.92	0	1007.58	248.45
14-04-2021	3.05	212.55	31.65	93.31	0	1006.81	146.97
15-04-2021	4.07	176.32	30.11	91.52	6.62	1006.44	198.32
16-04-2021	4.1	220.39	31.25	93.13	0	1005.71	283.72
17-04-2021	4.25	211.81	32.36	92	0	1006.22	274.01
18-04-2021	3.94	237.91	32.61	93.13	0	1007.01	275.44
19-04-2021	3.76	234.45	32.96	93.96	0	1004.73	277.04
20-04-2021	4.04	233.37	32.98	92.68	0	1003.92	265.46
21-04-2021	3.81	238.4	32.88	93.33	0	1005.51	269.56
22-04-2021	4.21	235.02	32.78	93.05	0	1005.85	268.13
23-04-2021	3.26	217.8	32.75	93.24	0	1005.55	228.72
24-04-2021	2.98	212.94	32.61	95.51	0	1005.32	231.64
25-04-2021	3.23	233.12	32.81	93.08	0	1005.16	269.76
26-04-2021	3.53	244.05	32.77	89.37	0	1004.71	284.67
27-04-2021	3.22	219.08	32.85	92.39	0	1005.27	281.77
28-04-2021	3.51	218.4	32.88	94.39	0	1005.59	259.79
29-04-2021	3.82	190.46	33.01	92.47	0	1004.96	264.46
30-04-2021	3.94	165.76	33.18	91.94	0	1004.73	277.46

May - 2021

Date	Ambient Temperature (°C)			Atmospheric Pressure (mbar)			Predominant wind Direction (Blowing From)	Wind Speed (m/s)			Relative Humidity (%)			Rainfall mm
	Min	Max	Avg	Min	Max	Avg		Min	Max	Avg	Min	Max	Avg	
01.05.21	28.1	32.2	30.2	1004.7	1009.9	1007.7	SE	0	5.4	3.6	71	91	85.0	0.0
02.05.21	28.8	31.4	30.2	1003.7	1009.4	1006.5	SE	0.4	4.9	3.4	82	90	85.7	0.0
03.05.21	28.2	31	30.1	1004.8	1008.4	1006.5	SE	0.4	7.2	4.2	83	90	85.7	0.0
04.05.21	27.8	31.2	29.9	1005.7	1009.9	1007.6	SE	0	8.5	4.8	79	91	84.0	0.0
05.05.21	29.4	30.9	30.1	1004.8	1010.4	1007.6	SE	0.4	3.6	2.3	81	86	83.0	0.0
06.05.21	29.4	31.2	30.3	1006.2	1011	1008.5	ESE	0.9	3.6	2.5	80	86	83.8	0.0
07.05.21	28.6	31	30.1	1007	1010.2	1008.7	ESE	0	4	2.2	81	88	83.8	0.0
08.05.21	28.2	31.6	30.1	1005.5	1008.8	1007.2	ESE	0	3.6	1.6	80	89	83.5	0.0
09.05.21	28.8	31.6	30.3	1004.4	1008.3	1006.4	N	0	3.6	2.0	78	88	83.5	0.0
10.05.21	28.3	31.6	30.2	1003.9	1007.9	1006.0	SE	0.4	3.6	2.6	79	90	84.5	0.0
11.05.21	25.7	31.7	30.1	1002.3	1007	1005.2	N	0.9	4	2.7	81	91	86.4	0.6
12.05.21	29.4	31.1	30.2	1001.3	1005.8	1003.8	SSE	1.8	4	3.0	85	92	88.2	0.0
13.05.21	29.3	31.1	30.2	1001.2	1005.6	1003.8	SE	0.9	4	2.7	85	92	88.7	0.0
14.05.21	29.4	30.7	30.1	1001.3	1004.4	1002.9	SE	2.7	4	3.5	77	91	85.9	0.0
15.05.21	29.3	30.8	29.9	1000.8	1005.5	1003.1	SE	2.2	4.5	3.5	78	92	84.9	0.0
16.05.21	28.9	30.8	29.5	1002.6	1007.5	1004.8	SSE	2.7	4.5	3.3	79	93	89.3	0.0
17.05.21	28.9	30.6	29.5	1003.4	1006.9	1005.3	N	1.8	4	3.2	81	94	91.0	0.0
18.05.21	28.6	30.6	29.5	1003.4	1006.9	1005.3	SSE	2.2	4	3.2	87	94	91.0	0.0
19.05.21	28.2	31.7	29.6	1002.3	1006.9	1004.7	N	0	4	2.2	74	94	87.2	0.0
20.05.21	26.9	32.9	28.6	1003	1007.2	1005.3	N	0	3.6	2.0	71	90	84.1	0.0
21.05.21	25.9	34.2	27.9	1003.2	1006.2	1005.0	N	0.4	3.6	2.2	65	91	85.4	0.4
22.05.21	28.3	31.9	29.7	1002.2	1006	1004.0	N	0.4	2.7	1.5	72	91	82.0	0.0
23.05.21	28.4	33.8	30.2	1002.3	1006.1	1003.9	N	0.4	3.1	2.0	67	92	84.0	0.0
24.05.21	29.3	34.1	31.6	1000	1004.4	1002.1	N	0	3.1	1.5	67	90	75.5	0.0
25.05.21	27.9	36.2	31.3	999.3	1003.1	1001.2	N	0.9	4.9	3.0	58	91	72.1	0.0
26.05.21	29.9	36.7	32.1	998	1003.1	1000.5	N	0.4	3.1	2.4	56	88	72.4	0.0
27.05.21	28.7	37.2	31.8	1000	1005.1	1002.6	N	0	3.6	1.3	53	93	74.0	0.0
28.05.21	29.1	34.2	30.8	1001.8	1006.1	1004.2	N	0	4	2.4	62	90	79.3	0.0
29.05.21	29.4	34.4	30.9	1002.6	1006.2	1004.5	N	0.4	3.6	1.8	64	91	80.9	0.0
30.05.21	27.9	34.9	31.0	1002.2	1005.3	1003.8	N	0.9	3.6	2.2	63	86	77.4	0.0
31.05.21	29.3	35.9	30.5	1000.7	1008.5	1004.1	N	0.9	8	4.8	62	92	86.4	0.0

Jun - 2021

Date	Ambient Temperature (°C)			Atmospheric Pressure (mbar)			Predominant wind Direction (Blowing From)	Wind Speed (m/s)			Relative Humidity (%)			Rainfall mm
	Min	Max	Avg	Min	Max	Avg		Min	Max	Avg	Min	Max	Avg	
01.06.21	29.4	34.6	30.9	1001.6	1005.3	1003.6	N	0	3.1	1.8	66	90	81.9	0.0
02.06.21	29.4	31.1	30.3	1002.2	1006.1	1004.4	N	0.9	3.1	2.4	77	94	87.0	0.0
03.06.21	29.1	32.9	30.2	1004	1008	1005.8	N	2.2	3.6	2.9	69	94	87.1	0.0
04.05.21	28.2	31	29.7	1004.1	1009.1	1007.0	N	0	4	2.1	83	93	88.2	0.0
05.06.21	28.7	30.2	29.5	1003.9	1008.3	1006.5	N	0	4	2.5	82	90	86.8	0.0
06.06.21	26.8	31.3	29.2	1003.7	1008.4	1006.2	N	0	3.6	1.9	74	87	83.7	0.0
07.06.21	29.2	34.3	30.4	1003.1	1007.6	1005.7	N	0.9	3.6	2.4	69	89	83.2	0.2
08.06.21	26.7	33.3	29.5	1002.6	1007	1005.1	N	0.4	4	2.4	73	93	87.4	6.4
09.06.21	27.7	35.9	30.6	1001.4	1005.1	1003.6	N	0.4	3.6	2.4	59	92	79.0	1.0
10.06.21	29.1	34.9	30.7	1000.2	1004.2	1002.5	N	0.4	3.6	2.2	57	93	77.4	0.0
11.06.21	29.4	33.6	31.4	1001	1004.5	1002.6	N	0.9	3.1	2.4	61	87	69.6	0.0
12.06.21	27.1	35.7	30.7	1001	1004	1002.6	N	1.8	4	2.7	58	89	72.9	1.6
13.06.21	28.1	35.2	31.0	999.9	1004.2	1002.2	N	2.2	6.7	3.6	57	85	70.1	0.6
14.06.21	29.4	34.1	31.0	999.7	1004.1	1002.1	N	0.9	4.9	3.2	62	76	69.5	0.0
15.06.21	27.4	36.7	30.8	999.5	1003.5	1001.7	N	1.8	4.9	3.8	54	92	73.6	0.0
16.06.21	28.8	35.8	31.2	1000.2	1005.2	1003.0	N	0.4	4.5	2.7	56	92	71.9	0.0
17.06.21	28.8	34.3	30.4	1001.6	1007.5	1005.3	N	0.9	4	2.3	55	89	75.2	0.0
18.06.21	28.9	34.3	30.4	1003.5	1007.5	1005.3	N	0	4	2.3	60	89	75.2	0.0
19.06.21	28.6	35.1	30.3	1004.4	1009	1006.7	N	1.8	3.1	2.5	56	91	75.5	0.0
20.06.21	28.8	35.8	30.7	1004.5	1008.9	1006.8	N	0.4	3.1	2.0	56	89	75.2	0.0
21.06.21	28.8	34.3	30.5	1003.4	1007.6	1005.6	N	0.4	3.1	2.1	59	88	78.3	0.0
22.06.21	26.9	33	29.2	1002.6	1007.1	1005.1	N	0.9	3.6	2.5	65	90	82.8	0.0
23.06.21	28.8	32.8	29.6	1003.2	1006.8	1005.0	N	0.4	3.1	2.1	69	91	84.7	1.6
24.06.21	24	33.8	28.7	1003.4	1007.3	1005.6	N	0.9	3.1	2.0	65	94	84.0	5.0
25.06.21	27.5	33.4	29.9	1001.3	1006	1004.1	N	0	3.1	1.4	62	92	81.0	0.0
26.06.21	27.9	32.4	30.1	1002	1005.1	1003.6	N	0	3.1	1.6	66	91	78.0	0.0
27.06.21	27.3	31.8	29.0	1003.5	1006.9	1005.1	N	0.4	3.1	1.8	70	89	81.0	0.0
28.06.21	24.6	31.5	27.7	1004.1	1008	1005.8	N	0.4	3.6	2.1	74	95	88.3	4.2
29.06.21	26.9	30.3	29.0	1003.5	1006.9	1005.4	N	0.4	3.6	2.6	80	94	87.5	0.0
30.06.21	27.9	30.1	29.2	1002.2	1006.3	1004.5	N	2.2	3.6	2.9	82	94	88.8	0.0

WIND PATTERN - Jan- 2021

Direction	0 <= ws < 1	1 <= ws < 2	2 <= ws < 3	3 <= ws < 4	4 <= ws < 5	ws >= 5	Avg. wind Speed (m/s)	Number of events	Events (%)
N	68	84	12	0	0	0	1.32	164	22.1
NNE	200	129	27	0	0	0	1.10	356	47.9
NE	89	26	4	0	0	0	1.10	119	16.0
ENE	17	3	1	0	0	0	0.96	21	2.8
E	11	4	2	0	0	0	1.10	17	2.3
ESE	0	1	1	0	0	0	1.75	2	0.3
SE	0	0	0	0	0	0	0.00	0	0.0
SSE	1	0	0	0	0	0	0.90	1	0.1
S	0	0	0	0	0	0	0.00	0	0.0
SSW	0	0	0	0	0	0	0.00	0	0.0
SW	0	0	0	0	0	0	0.00	0	0.0
WSW	0	0	0	0	0	0	0.00	0	0.0
W	7	0	0	0	0	0	0.00	7	0.9
WNW	32	2	0	1	0	0	1.25	35	4.7
NW	6	3	4	3	0	0	1.95	16	2.2
NNW	2	3	0	0	0	0	0.90	5	0.7
								743	
Number of events	433	255	51	4	0	0	743		
Events (%)	58.3	34.3	6.9	0.5	0.0	0.0			

WIND PATTERN - Feb- 2021

Direction	0 <= ws < 1	1 <= ws < 2	2 <= ws < 3	3 <= ws < 4	4 <= ws < 5	ws >= 5	Avg. wind Speed (m/s)	Number of events	Events (%)
N	233	63	14	7	0	0	1.78	317	47.2
NNE	53	5	0	0	0	0	0.88	58	8.6
NE	72	0	1	0	0	0	0.88	73	10.9
ENE	40	3	0	0	0	0	0.65	43	6.4
E	48	3	1	0	0	0	1.06	52	7.7
ESE	8	7	7	0	0	0	1.33	22	3.3
SE	5	5	8	8	0	0	1.95	26	3.9
SSE	1	2	0	0	0	0	1.03	3	0.4
S	1	0	0	0	0	0	0.00	1	0.1
SSW	0	0	0	0	0	0	0.00	0	0.0
SW	10	4	0	0	0	0	0.65	14	2.1
WSW	5	0	0	0	0	0	0.00	5	0.7
W	18	0	0	0	0	0	0.00	18	2.7
WNW	30	1	0	0	0	0	0.78	31	4.6
NW	5	1	1	0	0	0	1.33	7	1.0
NNW	1	0	0	0	0	0	0.00	1	0.1
								671	
Number of events	530	94	32	15	0	0	671		
Events (%)	79	14	4.8	2.2	0.0	0.0			

WIND PATTERN - Mar- 2021

Direction	0 <= ws < 1	1 <= ws < 2	2 <= ws < 3	3 <= ws < 4	4 <= ws < 5	ws >= 5	Avg. wind Speed (m/s)	Number of events	Events (%)
N	65	49	49	40	0	0	1.78	203	27.4
NNE	1	0	0	0	0	0	0.00	1	0.1
NE	4	0	0	0	0	0	0.20	4	0.5
ENE	29	2	0	0	0	0	0.65	31	4.2
E	72	15	0	0	0	0	0.88	87	11.7
ESE	62	28	41	10	0	0	1.78	141	19.0
SE	27	15	12	24	5	0	2.23	83	11.2
SSE	15	7	8	10	2	0	2.23	42	5.7
S	2	4	2	3	0	0	2.10	11	1.5
SSW	1	2	1	2	0	0	1.78	6	0.8
SW	18	7	2	2	0	0	1.46	29	3.9
WSW	20	0	0	0	0	0	0.20	20	2.7
W	31	1	0	0	0	0	0.65	32	4.3
WNW	44	0	0	0	0	0	0.00	44	5.9
NW	7	0	0	0	0	0	0.00	7	0.9
NNW	0	0	0	0	0	0	0.00	0	0.0
								741	

Number of events	398	130	115	91	7	0	741
Events (%)	53.7	17.5	15.5	12.3	0.8	0.0	

WIND PATTERN - Apr- 2021

Direction	0 <= ws < 1	1 <= ws < 2	2 <= ws < 3	3 <= ws < 4	4 <= ws < 5	ws >= 5	Avg. wind Speed (m/s)	Number of events	Events (%)
N	65	49	49	40	0	0	1.78	203	27.4
NNE	1	0	0	0	0	0	0.00	1	0.1
NE	4	0	0	0	0	0	0.20	4	0.5
ENE	29	2	0	0	0	0	0.65	31	4.2
E	72	15	0	0	0	0	0.88	87	11.7
ESE	62	28	41	10	0	0	1.78	141	19.0
SE	27	15	12	24	5	0	2.23	83	11.2
SSE	15	7	8	10	2	0	2.23	42	5.7
S	2	4	2	3	0	0	2.10	11	1.5
SSW	1	2	1	2	0	0	1.78	6	0.8
SW	18	7	2	2	0	0	1.46	29	3.9
WSW	20	0	0	0	0	0	0.20	20	2.7
W	31	1	0	0	0	0	0.65	32	4.3
WNW	44	0	0	0	0	0	0.00	44	5.9
NW	7	0	0	0	0	0	0.00	7	0.9
NNW	0	0	0	0	0	0	0.00	0	0.0
								741	

Number of events	398	130	115	91	7	0	741
Events (%)	53.7	17.5	15.5	12.3	0.8	0.0	

WIND PATTERN - May- 2021

Direction	0 <= ws < 1	1 <= ws < 2	2 <= ws < 3	3 <= ws < 4	4 <= ws < 5	ws >= 5	Avg. wind Speed (m/s)	Number of events	Events (%)
N	83	68	95	87	5	1	2.85	339	45.6
NNE	0	0	0	0	0	0	0.00	0	0.0
NE	0	0	0	0	0	0	0.00	0	0.0
ENE	0	0	0	0	0	0	0.00	0	0.0
E	0	0	0	0	0	0	0.00	0	0.0
ESE	3	3	10	32	0	0	2.22	48	6.5
SE	8	8	20	110	17	36	4.27	199	26.8
SSE	12	16	55	38	3	4	3.16	128	17.2
S	6	2	7	1	0	0	1.59	16	2.2
SSW	0	0	0	0	1	1	5.15	2	0.3
SW	4	0	0	0	1	0	1.45	5	0.7
WSW	0	0	0	0	0	0	0.00	0	0.0
W	2	0	0	0	0	0	0.00	2	0.3
WNW	4	0	0	0	0	0	0.00	4	0.5
NW	0	0	0	0	0	0	0.00	0	0.0
NNW	0	0	0	0	0	0	0.00	0	0.0
								743	

Number of events	122	97	187	268	27	42	743
Events (%)	16.4	13.1	25.2	36.1	3.6	5.7	

WIND PATTERN - Jun- 2021

Direction	0 <= ws < 1	1 <= ws < 2	2 <= ws < 3	3 <= ws < 4	4 <= ws < 5	ws >= 5	Avg. wind Speed (m/s)	Number of events	Events (%)
N	104	119	228	213	35	2	3.03	701	97.5
NNE	0	0	0	0	0	0	0.00	0	0.0
NE	0	0	1	2	0	0	2.90	3	0.4
ENE	0	0	0	0	0	0	0.00	0	0.0
E	0	0	0	0	0	0	0.00	0	0.0
ESE	0	0	0	0	0	0	0.00	0	0.0
SE	0	0	1	3	0	0	2.90	4	0.6
SSE	0	0	4	1	1	0	3.27	6	0.8
S	0	1	2	1	0	0	2.45	4	0.6
SSW	0	0	0	0	0	0	0.00	0	0.0
SW	0	0	0	1	0	0	3.10	1	0.1
WSW	0	0	0	0	0	0	0.00	0	0.0
W	0	0	0	0	0	0	0.00	0	0.0
WNW	0	0	0	0	0	0	0.00	0	0.0
NW	0	0	0	0	0	0	0.00	0	0.0
NNW	0	0	0	0	0	0	0.00	0	0.0
								719	

Number of events	104	120	236	221	36	2	719
Events (%)	14.5	16.7	32.8	30.7	5.0	0.3	

ii. AMBIENT AIR QUALITY

Ambient air quality monitoring is required to determine the existing quality of air, evaluation of the effectiveness of control system and to identify areas in need of restoration and their prioritization. In order to generate background data, air quality monitoring is conducted to assess existing level of contamination and to assess possible effects of air contamination occurring in future.

Frequency of Monitoring

The frequency of monitoring that has been followed for sampling of ambient air quality is that one sample per weekly twice at three locations.

DETAILS OF AMBIENT AIR QUALITY MONITORING LOCATIONS

Station code	Location	Geographical location	Environmental setting
AAQ1	Port operating building	13^0 16' 12" N 80^0 20' 5" E	Industrial
AAQ2	RMU Building	13^0 16' 25" N 80^0 20' 16" E	Industrial
AAQ3	In Terminal Gate	13^0 16' 25" N 80^0 20' 0" E	Industrial

Fig – 2. AMBIENT AIR SAMPLING LOCATION MAP

METHODOLOGY USED FOR AMBIENT AIR QUALITY MONITORING

S.No	Parameter	METHODOLOGY	Unit	Minimum Detectable Limit
1	PM_{10}	Respirable Dust Sampler (Gravimetric method)	$\mu g/m^3$	1.0
2	$PM_{2.5}$	Fine particle Sampler (Gravimetric method)	$\mu g/m^3$	5.0
3	Sulphur Dioxide	Modified West and Gaeke method	$\mu g/m^3$	4.0
4	Nitrogen Oxide	Jacob & Hochheiser method	$\mu g/m^3$	6.0
5	Lead	Atomic Absorption Spectrometry	$\mu g/m^3$	0.5
6	Carbon Monoxide	Draggers Tube	mg/m^3	0.1
7	Ozone	UV Photometric	$\mu g/m^3$	2.0
8	Ammonia	Indophenol blue method	$\mu g/m^3$	2.0
9	Benzene	Gas Chromatography	$\mu g/m^3$	1.0
10	Benzene (α) pyrene	Gas Chromatography	ng/m^3	0.1
11	Arsenic	Atomic Absorption Spectrometry	ng/m^3	1.0
12	Nickel	Atomic Absorption Spectrometry	ng/m^3	5.0

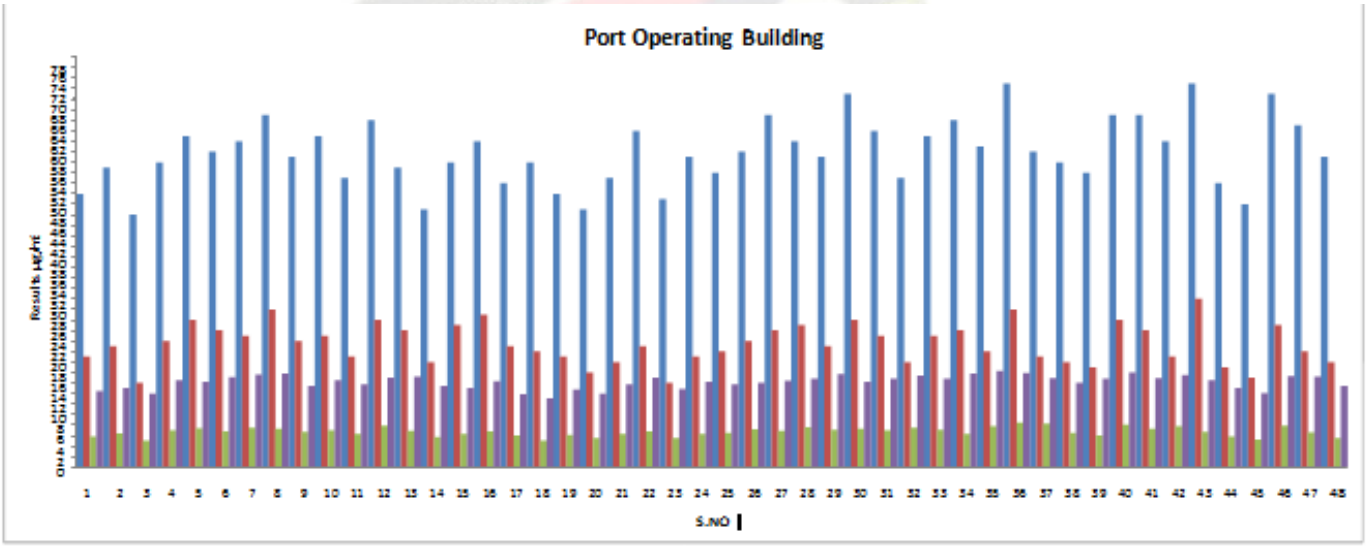
Results and Discussion

The results of the ambient air quality for the study period are presented and discussed. The minimum, maximum 98th percentile and average values have been computed from the observed raw data for all the AAQ monitoring stations. The summary of these results for all the locations is presented in the Table and the detailed analytical results are shown in Annexure - 2. These are compared with the standards prescribed by Central Pollution Control Board (CPCB) for "Industrial, Rural, Residential and other areas"

Annexure - 2

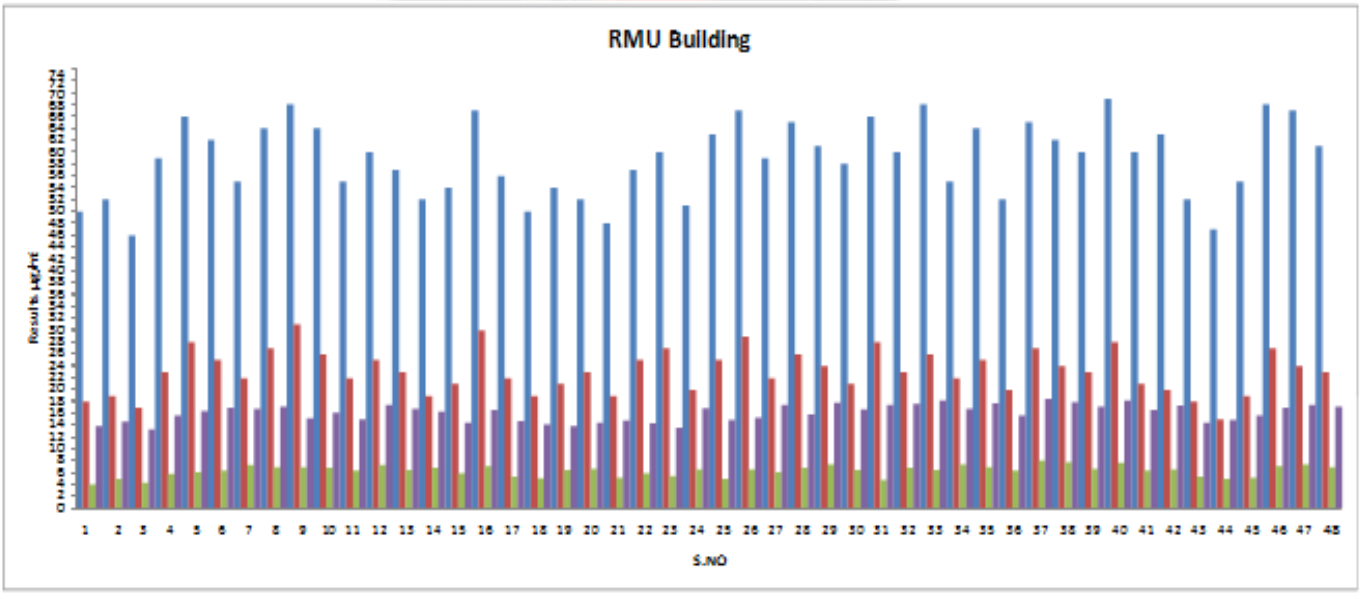
PORT OPERATING BUILDING (AAQ1)													
Parameters			Particular matter PM10	Particular matter PM2.5	Sulphur dioxide as SO2	Nitrogen dioxide as NO2	Lead as Pb	Carbon monoxide as CO	Ozone as O3	Ammonia as NH3	Arsenic as As	Nickel as Ni	Benzene as C6H6	Benzo (a) pyrene as BaP
Unit			µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	mg/m3	µg/m3	µg/m3	ng/m3	ng/m3	µg/m3	ng/m3
National AAQM Standard			100	60	80	80	1	4	180	400	6	20	5	1
S.No.	Sampling	Report Number												
1	04.01.2021	GCS/LAB/S/3176/20-21	52	21	5.8	14.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
2	06.01.2021	GCS/LAB/S/3176/20-21	57	23	6.4	15.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
3	08.01.2021	GCS/LAB/S/3176/20-21	48	16	5.1	14.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
4	11.01.2021	GCS/LAB/S/3176/20-21	58	24	7.0	16.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
5	18.01.2021	GCS/LAB/S/3176/20-21	63	28	7.4	16.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
6	22.01.2021	GCS/LAB/S/3176/20-21	60	26	6.8	17.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
7	27.01.2021	GCS/LAB/S/3176/20-21	62	25	7.5	17.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
8	29.01.2021	GCS/LAB/S/3176/20-21	67	30	7.3	17.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
9	01.02.2021	GCS/LAB/S/3219/20-21	59	24	6.7	15.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
10	05.02.2021	GCS/LAB/S/3219/20-21	63	25	7.0	16.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
11	08.02.2021	GCS/LAB/S/3219/20-21	55	21	6.3	15.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
12	12.02.2021	GCS/LAB/S/3219/20-21	66	28	7.9	17.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
13	15.02.2021	GCS/LAB/S/3219/20-21	57	26	6.9	17.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
14	19.02.2021	GCS/LAB/S/3219/20-21	49	20	5.7	15.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
15	22.02.2021	GCS/LAB/S/3219/20-21	58	27	6.3	15.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
16	26.02.2021	GCS/LAB/S/3219/20-21	62	29	6.8	16.3	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
17	01.03.2021	GCS/LAB/S/3313/20-21	54	23	6.0	13.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
18	05.03.2021	GCS/LAB/S/3313/20-21	58	22	5.0	13.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1

19	08.03.2021	GCS/LAB/S/3313/20-21	52	21	6.1	14.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
20	12.03.2021	GCS/LAB/S/3313/20-21	49	18	5.5	14.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
21	15.03.2021	GCS/LAB/S/3313/20-21	55	20	6.3	15.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
22	19.03.2021	GCS/LAB/S/3313/20-21	64	23	6.8	17.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
23	22.03.2021	GCS/LAB/S/3313/20-21	51	16	5.5	14.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
24	26.03.2021	GCS/LAB/S/3313/20-21	59	21	6.3	16.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
25	02.04.2021	GCS/LAB/S/3377/21-22	56	22	6.5	15.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
26	07.04.2021	GCS/LAB/S/3377/21-22	60	24	7.2	16.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
27	09.04.2021	GCS/LAB/S/3377/21-22	67	26	6.9	16.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
28	12.04.2021	GCS/LAB/S/3377/21-22	62	27	7.6	16.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
29	16.04.2021	GCS/LAB/S/3377/21-22	59	23	7.1	17.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
30	19.04.2021	GCS/LAB/S/3377/21-22	71	28	7.3	16.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
31	23.04.2021	GCS/LAB/S/3377/21-22	64	25	7.0	16.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
32	26.04.2021	GCS/LAB/S/3377/21-22	55	20	7.5	17.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
33	03.05.2021	GCS/LAB/S/3423/21-22	63	25	7.1	16.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
34	07.05.2021	GCS/LAB/S/3423/21-22	66	26	6.3	17.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
35	12.05.2021	GCS/LAB/S/3423/21-22	61	22	7.8	18.3	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
36	14.05.2021	GCS/LAB/S/3423/21-22	73	30	8.5	17.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
37	17.05.2021	GCS/LAB/S/3423/21-22	60	21	8.3	16.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
38	21.05.2021	GCS/LAB/S/3423/21-22	58	20	6.5	16.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
39	25.05.2021	GCS/LAB/S/3423/21-22	56	19	6.0	16.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
40	27.05.2021	GCS/LAB/S/3423/21-22	67	28	8.1	18.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
41	01.06.2021	GCS/LAB/S/3503/21-22	67	26	7.3	16.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
42	04.06.2021	GCS/LAB/S/3503/21-22	62	21	7.8	17.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
43	07.06.2021	GCS/LAB/S/3503/21-22	73	32	6.7	16.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
44	11.06.2021	GCS/LAB/S/3503/21-22	54	19	5.8	15.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
45	14.06.2021	GCS/LAB/S/3503/21-22	50	17	5.2	14.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
46	18.06.2021	GCS/LAB/S/3503/21-22	71	27	7.9	17.3	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
47	21.06.2021	GCS/LAB/S/3503/21-22	65	22	6.6	17.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
48	25.06.2021	GCS/LAB/S/3503/21-22	59	20	5.5	15.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1



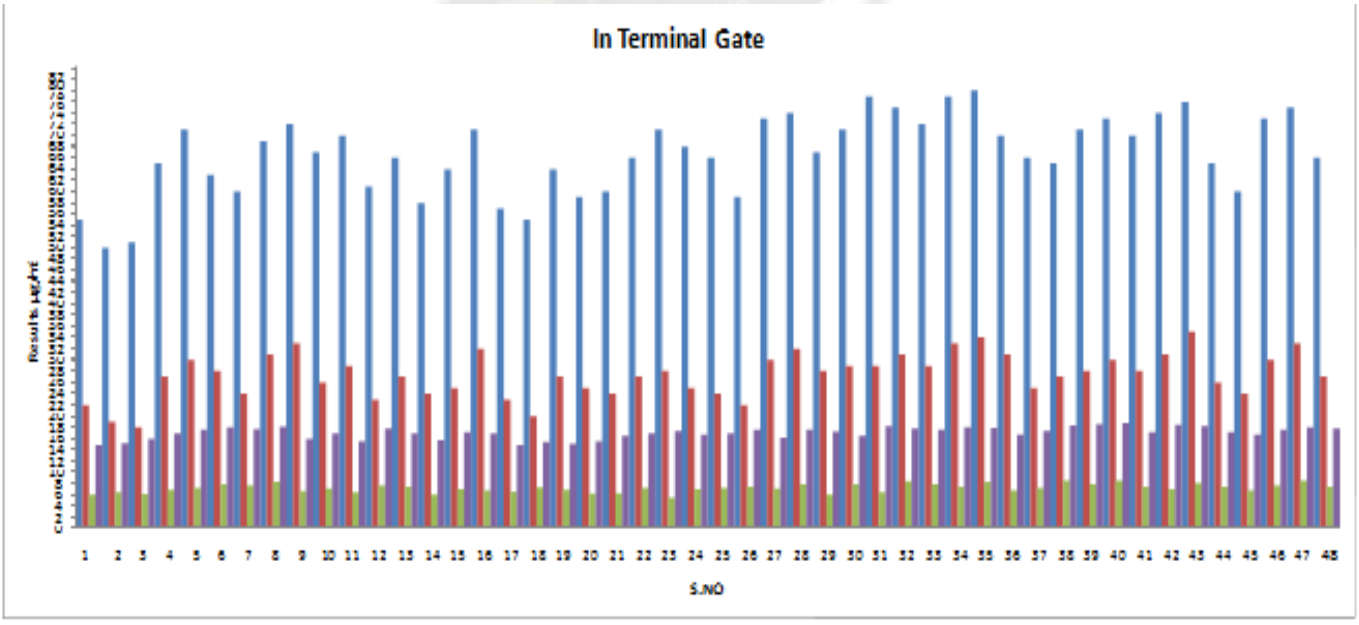
RMU BUILDING (AAQ2)														
Parameters			Particular matter PM10	Particular matter PM2.5	Sulphur dioxide as SO2	Nitrogen dioxide as NO2	Lead as Pb	Carbon monoxide as CO	Ozone as O3	Ammonia as NH3	Arsenic as As	Nickel as Ni	Benzene as C6H6	Benzo (a) pyrene as BaP
Unit			µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	mg/m3	µg/m3	µg/m3	ng/m3	ng/m3	µg/m3	ng/m3
National AAQM Standard			100	60	80	80	1	4	180	400	6	20	5	1
S.No.	Sampling	Report Number												
1	04.01.2021	GCS/LAB/S/3176/20-21	50	18	4.1	13.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
2	06.01.2021	GCS/LAB/S/3176/20-21	52	19	5.0	14.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
3	08.01.2021	GCS/LAB/S/3176/20-21	46	17	4.4	13.3	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
4	11.01.2021	GCS/LAB/S/3176/20-21	59	23	5.8	15.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
5	18.01.2021	GCS/LAB/S/3176/20-21	66	28	6.1	16.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
6	22.01.2021	GCS/LAB/S/3176/20-21	62	25	6.4	17.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
7	27.01.2021	GCS/LAB/S/3176/20-21	55	22	7.3	16.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
8	29.01.2021	GCS/LAB/S/3176/20-21	64	27	7.0	17.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
9	01.02.2021	GCS/LAB/S/3219/20-21	68	31	7.0	15.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
10	05.02.2021	GCS/LAB/S/3219/20-21	64	26	6.8	16.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
11	08.02.2021	GCS/LAB/S/3219/20-21	55	22	6.4	15.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
12	12.02.2021	GCS/LAB/S/3219/20-21	60	25	7.3	17.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
13	15.02.2021	GCS/LAB/S/3219/20-21	57	23	6.5	16.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
14	19.02.2021	GCS/LAB/S/3219/20-21	52	19	6.9	16.3	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
15	22.02.2021	GCS/LAB/S/3219/20-21	54	21	6.0	14.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
16	26.02.2021	GCS/LAB/S/3219/20-21	67	30	7.2	16.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
17	01.03.2021	GCS/LAB/S/3313/20-21	56	22	5.3	14.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
18	05.03.2021	GCS/LAB/S/3313/20-21	50	19	5.1	14.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
19	08.03.2021	GCS/LAB/S/3313/20-21	54	21	6.5	13.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
20	12.03.2021	GCS/LAB/S/3313/20-21	52	23	6.7	14.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1

21	15.03.2021	GCS/LAB/S/3313/20-21	48	19	5.2	14.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
22	19.03.2021	GCS/LAB/S/3313/20-21	57	25	6.0	14.3	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
23	22.03.2021	GCS/LAB/S/3313/20-21	60	27	5.5	13.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
24	26.03.2021	GCS/LAB/S/3313/20-21	51	20	6.6	16.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
25	02.04.2021	GCS/LAB/S/3377/21-22	63	25	5.0	14.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
26	07.04.2021	GCS/LAB/S/3377/21-22	67	29	6.6	15.3	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
27	09.04.2021	GCS/LAB/S/3377/21-22	59	22	6.1	17.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
28	12.04.2021	GCS/LAB/S/3377/21-22	65	26	6.9	15.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
29	16.04.2021	GCS/LAB/S/3377/21-22	61	24	7.4	17.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
30	19.04.2021	GCS/LAB/S/3377/21-22	58	21	6.5	16.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
31	23.04.2021	GCS/LAB/S/3377/21-22	66	28	4.8	17.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
32	26.04.2021	GCS/LAB/S/3377/21-22	60	23	6.9	17.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
33	03.05.2021	GCS/LAB/S/3423/21-22	68	26	6.5	18.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
34	07.05.2021	GCS/LAB/S/3423/21-22	55	22	7.4	16.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
35	12.05.2021	GCS/LAB/S/3423/21-22	64	25	7.0	17.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
36	14.05.2021	GCS/LAB/S/3423/21-22	52	20	6.4	15.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
37	17.05.2021	GCS/LAB/S/3423/21-22	65	27	8.1	18.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
38	21.05.2021	GCS/LAB/S/3423/21-22	62	24	7.8	17.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
39	25.05.2021	GCS/LAB/S/3423/21-22	60	23	6.7	17.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
40	27.05.2021	GCS/LAB/S/3423/21-22	69	28	7.7	18.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
41	01.06.2021	GCS/LAB/S/3503/21-22	60	21	6.4	16.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
42	04.06.2021	GCS/LAB/S/3503/21-22	63	20	6.6	17.3	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
43	07.06.2021	GCS/LAB/S/3503/21-22	52	18	5.3	14.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
44	11.06.2021	GCS/LAB/S/3503/21-22	47	15	5.0	14.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
45	14.06.2021	GCS/LAB/S/3503/21-22	55	19	5.2	15.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
46	18.06.2021	GCS/LAB/S/3503/21-22	68	27	7.1	17.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
47	21.06.2021	GCS/LAB/S/3503/21-22	67	24	7.4	17.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
48	25.06.2021	GCS/LAB/S/3503/21-22	61	23	7.0	17.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1



IN TERMINAL GATE (AAQ3)														
Parameters			Particular matter PM10	Particular matter PM2.5	Sulphur dioxide as SO2	Nitrogen dioxide as NO2	Lead as Pb	Carbon monoxide as CO	Ozone as O3	Ammonia as NH3	Arsenic as As	Nickel as Ni	Benzene as C6H6	Benzo (a) pyrene as BaP
Unit			µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	mg/m3	µg/m3	µg/m3	ng/m3	ng/m3	µg/m3	ng/m3
National AAQM Standard			100	60	80	80	1	4	180	400	6	20	5	1
S.No.	Sampling	Report Number												
1	04.01.2021	GCS/LAB/S/3176/20-21	55	22	6.0	14.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
2	06.01.2021	GCS/LAB/S/3176/20-21	50	19	6.5	15.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
3	08.01.2021	GCS/LAB/S/3176/20-21	51	18	6.1	15.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
4	11.01.2021	GCS/LAB/S/3176/20-21	65	27	6.9	17.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
5	18.01.2021	GCS/LAB/S/3176/20-21	71	30	7.2	17.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
6	22.01.2021	GCS/LAB/S/3176/20-21	63	28	7.9	18.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
7	27.01.2021	GCS/LAB/S/3176/20-21	60	24	7.6	17.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
8	29.01.2021	GCS/LAB/S/3176/20-21	69	31	8.3	18.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
9	01.02.2021	GCS/LAB/S/3219/20-21	72	33	6.7	16.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
10	05.02.2021	GCS/LAB/S/3219/20-21	67	26	7.1	16.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
11	08.02.2021	GCS/LAB/S/3219/20-21	70	29	6.5	15.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
12	12.02.2021	GCS/LAB/S/3219/20-21	61	23	7.6	17.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
13	15.02.2021	GCS/LAB/S/3219/20-21	66	27	7.4	17.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
14	19.02.2021	GCS/LAB/S/3219/20-21	58	24	6.0	15.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
15	22.02.2021	GCS/LAB/S/3219/20-21	64	25	7.0	17.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
16	26.02.2021	GCS/LAB/S/3219/20-21	71	32	6.8	16.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
17	01.03.2021	GCS/LAB/S/3313/20-21	57	23	6.6	14.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
18	05.03.2021	GCS/LAB/S/3313/20-21	55	20	7.3	15.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
19	08.03.2021	GCS/LAB/S/3313/20-21	64	27	6.9	15.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
20	12.03.2021	GCS/LAB/S/3313/20-21	59	25	6.3	15.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
21	15.03.2021	GCS/LAB/S/3313/20-21	60	24	6.2	16.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
22	19.03.2021	GCS/LAB/S/3313/20-21	66	27	7.2	16.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1

23	22.03.2021	GCS/LAB/S/3313/20-21	71	28	5.5	17.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
24	26.03.2021	GCS/LAB/S/3313/20-21	68	25	7.0	16.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
25	02.04.2021	GCS/LAB/S/3377/21-22	66	24	7.2	17.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
26	07.04.2021	GCS/LAB/S/3377/21-22	59	22	7.5	17.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
27	09.04.2021	GCS/LAB/S/3377/21-22	73	30	7.1	16.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
28	12.04.2021	GCS/LAB/S/3377/21-22	74	32	7.9	17.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
29	16.04.2021	GCS/LAB/S/3377/21-22	67	28	6.0	17.3	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
30	19.04.2021	GCS/LAB/S/3377/21-22	71	29	7.8	16.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
31	23.04.2021	GCS/LAB/S/3377/21-22	77	29	6.5	18.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
32	26.04.2021	GCS/LAB/S/3377/21-22	75	31	8.4	17.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
33	03.05.2021	GCS/LAB/S/3423/21-22	72	29	7.9	17.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
34	07.05.2021	GCS/LAB/S/3423/21-22	77	33	7.4	18.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
35	12.05.2021	GCS/LAB/S/3423/21-22	78	34	8.3	17.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
36	14.05.2021	GCS/LAB/S/3423/21-22	70	31	6.8	16.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
37	17.05.2021	GCS/LAB/S/3423/21-22	66	25	7.2	17.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
38	21.05.2021	GCS/LAB/S/3423/21-22	65	27	8.5	18.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
39	25.05.2021	GCS/LAB/S/3423/21-22	71	28	7.9	18.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
40	27.05.2021	GCS/LAB/S/3423/21-22	73	30	8.6	18.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
41	01.06.2021	GCS/LAB/S/3503/21-22	70	28	7.5	17.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
42	04.06.2021	GCS/LAB/S/3503/21-22	74	31	7.0	18.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
43	07.06.2021	GCS/LAB/S/3503/21-22	76	35	8.1	18.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
44	11.06.2021	GCS/LAB/S/3503/21-22	65	26	7.4	17.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
45	14.06.2021	GCS/LAB/S/3503/21-22	60	24	6.8	16.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
46	18.06.2021	GCS/LAB/S/3503/21-22	73	30	7.7	17.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
47	21.06.2021	GCS/LAB/S/3503/21-22	75	33	8.5	18.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
48	25.06.2021	GCS/LAB/S/3503/21-22	66	27	7.5	17.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1



NATIONAL AMBIENT AIR QUALITY STANDARDS
CENTRAL POLLUTION CONTROL BOARD
NOTIFICATION

New Delhi, the 18th November, 2009

No.B-29016/20/90/PCI-L—In exercise of the powers conferred by Sub-section (2) (h) of section 16 of the Air (Prevention and Control of Pollution) Act, 1981 (Act No. 14 of 1981), and in super session of the Notification No(s). S.O. 384(E), dated 11th April, 1994 and S.O. 935(E), dated 14th October, 1998, the Central Pollution Control Board hereby notify the National Ambient Air Quality Standards with immediate effect, namely:-

NATIONAL AMBIENT AIR QUALITY STANDARDS

S. No.	Pollutant	Time Weighted average	Concentration in Ambient Air		Methods of Measurement
			Industrial, Residential, Rural and Other Area	Ecologically sensitive area (notified by Central Govt.)	
(1)	(2)	(3)	(4)	(5)	(6)
1	Sulphur Dioxide (SO_2), $\mu g/m^3$	Annual*	50	20	• Improved West and Geake • Ultraviolet fluorescence
		24 hours**	80	80	
2	Nitrogen Dioxide (NO_2), $\mu g/m^3$	Annual*	40	30	• Modified Jacob & Hochheiser (Na-Arsenite) • Chemiluminescence
		24 hours**	80	80	
3	Particulate Matter (size less than 10 μm) or $PM_{10} \mu g/m^3$	Annual*	60	60	• Gravimetric • TOEM • Beta attenuation
		24 hours**	100	100	
4	Particulate Matter (size less than 2.5 microns) or $PM_{2.5}$ $\mu g/m^3$	Annual*	40	40	• Gravimetric • TOEM • Beta attenuation
		24 hours**	60	60	
5	Ozone (O_3) $\mu g/m^3$	8 hours **	100	100	• UV photometric • Chemiluminescence • Chemical method
		1 hour **	180	180	
6	Lead (Pb) $\mu g/m^3$	Annual*	0.5	0.5	• ASS / ICP method after sampling on EPM 2000 or equivalent filter paper • ED – XRF using Teflon filter
		24 hours**	1.0	1.0	
7	Carbon Monoxide (CO) mg/m^3	8 hours**	2	2	Non Dispersive Infra RED (NDIR) Spectroscopy
		1 hour**	4	4	
8	Ammonia (NH_3) $\mu g/m^3$	Annual*	100	100	• Chemiluminescence • Indophenol blue method
		24 hours**	400	400	
9	Benzene (C_6H_6) $\mu g/m^3$	Annual*	5	5	• Gas chromatography based continuous analyser • Adsorption and desorption followed by GC analysis
10	Benzo (a) Pyrene (BaP) – particulate phase only ng/m^3	Annual*	1	1	Solvent extraction followed by HPLC / GC analysis
11	Arsenic (As) ng/m^3	Annual*	6	6	AAS / ICP method after sampling on EPM 2000 or equivalent filter paper
12	Nickel (Ni) ng/m^3	Annual*	20	20	AAS / ICP method after sampling on EPM 2000 or equivalent filter paper

* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Note: Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigation.

iii. AMBIENT NOISE LEVEL INTENSITY

Collection of ambient noise levels at four locations. Spot noise levels where measured with a pre calibrated Noise Level Meter – SL- 4023 SD for day and night periods. The Detailed report has been is enclosed as Annexure - 3

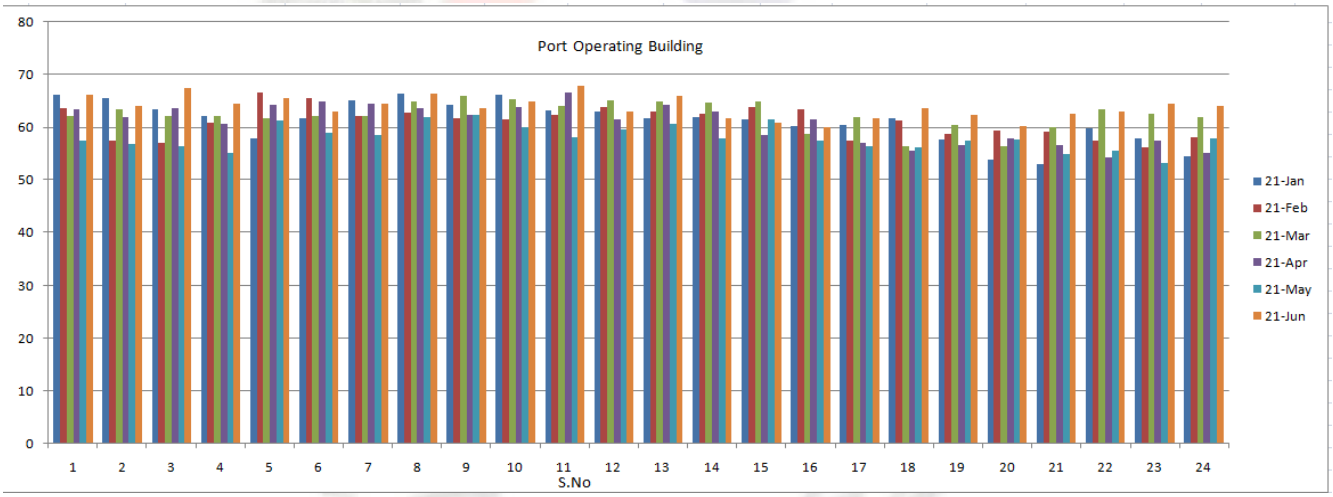
DETAILS OF NOISE MONITORING LOCATIONS

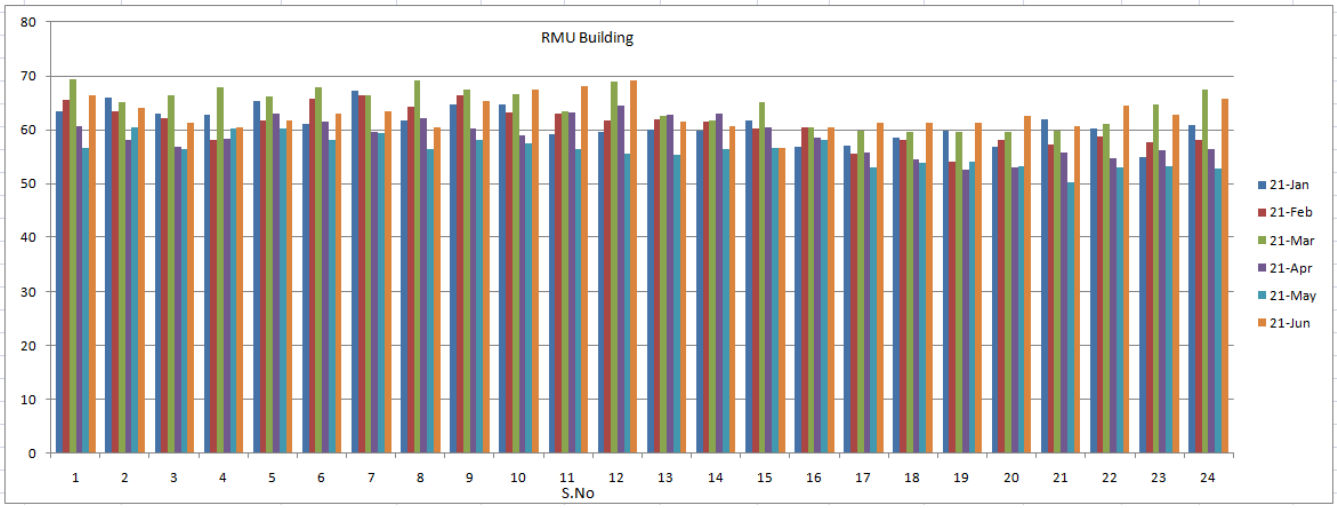
STATION CODE	LOCATIONS	Geographical Location
N1	In Terminal Gate	13^0 16' 25" N 80^0 20' 0" E
N2	RMU Building	13^0 16' 25" N 80^0 20' 16" E
N3	Port operating building	13^0 16' 12" N 80^0 20' 5" E

Fig – 3. Noise Level Sampling Locations

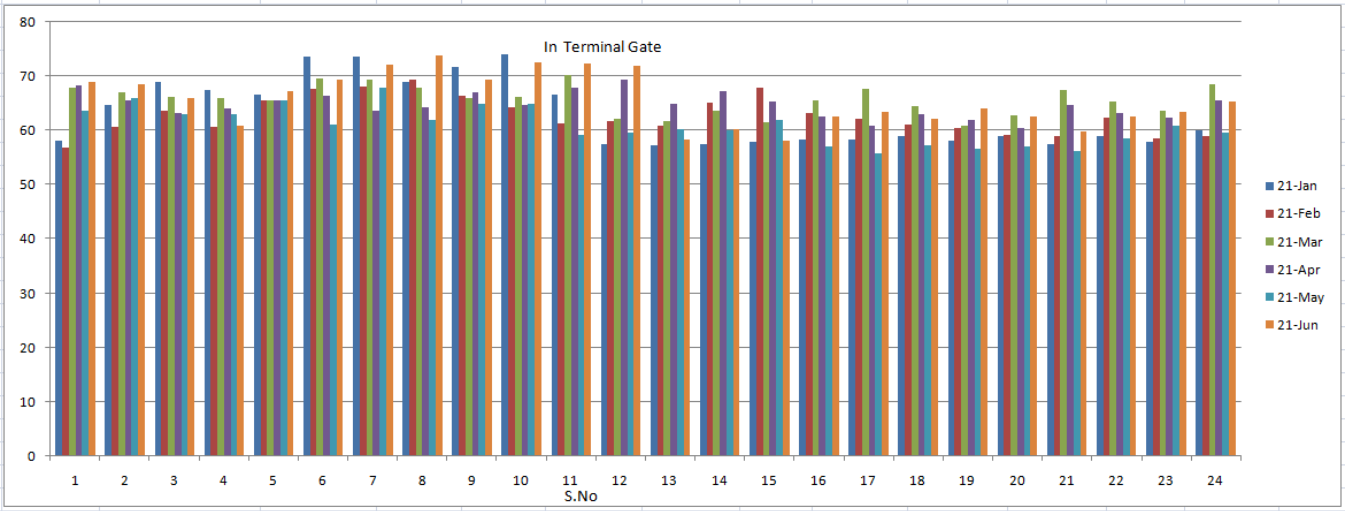
Annexure - 3

Location		PORT OPERATING BUILDING						RMU BUILDING					
Month & Year		Jan - 21	Feb - 21	Mar - 21	Apr - 21	May - 21	Jun - 21	Jan - 21	Feb - 21	Mar - 21	Apr - 21	May - 21	Jun - 21
Parameter & Unit		Leq	Leq dB(A)	Leq	Leq	Leq	Leq	Leq	Leq dB(A)	Leq	Leq	Leq	Leq
S.No	Time of Sampling												
1	06.00 – 07.00 (Day)	66.4	63.9	62.4	63.7	57.7	66.4	63.6	65.8	69.6	60.9	56.8	66.5
2	07.00 –08.00	65.8	57.7	63.6	62.1	57.1	64.3	66.1	63.7	65.3	58.4	60.7	64.3
3	08.00 – 09.00	63.7	57.3	62.3	63.8	56.7	67.4	63.1	62.4	66.7	57.1	56.7	61.4
4	09.00 – 10.00	62.4	61.1	62.3	60.9	55.4	64.6	63	58.2	68	58.6	60.4	60.6
5	10.00 – 11.00	58.1	66.9	62	64.4	61.5	65.8	65.6	62	66.4	63.2	60.4	61.9
6	11.00 – 12.00	62	65.7	62.3	65.2	59.2	63.1	61.2	65.9	68	61.7	58.3	63.2
7	12.00 – 13.00	65.4	62.4	62.4	64.7	58.8	64.7	67.4	66.5	66.5	59.8	59.5	63.7
8	13.00 – 14.00	66.5	63	65.2	63.9	62.1	66.6	61.9	64.5	69.4	62.3	56.6	60.6
9	14.00 – 15.00	64.5	62	66.1	62.6	62.5	63.9	65	66.5	67.7	60.5	58.2	65.5
10	15.00 – 16.00	66.3	61.8	65.5	64.1	60.3	65.1	64.9	63.4	66.8	59.2	57.7	67.6
11	16.00 – 17.00	63.3	62.5	64.3	66.8	58.4	67.9	59.3	63.1	63.7	63.4	56.6	68.2
12	17.00 – 18.00	63.1	64	65.3	61.7	59.8	63.2	59.7	61.9	69.1	64.7	55.8	69.3
13	18.00 – 19.00	61.9	63.1	65.2	64.5	60.8	66.1	60.3	62.2	62.8	62.9	55.5	61.8
14	19.00 –20.00	62.2	62.8	64.8	63.2	58.1	62	60.1	61.7	61.9	63.1	56.7	60.9
15	20.00 – 21.00	61.7	64	65.1	58.7	61.6	61.1	62	60.5	65.3	60.6	56.9	56.9
16	21.00 – 22.00	60.5	63.6	59	61.8	57.6	60.3	57	60.6	60.7	58.7	58.2	60.7
17	22.00 – 23.00 (Night)	60.6	57.7	62.2	57.2	56.7	62	57.3	55.7	59.9	55.9	53.1	61.4
18	23.00 – 00.00	62	61.5	56.5	55.7	56.3	63.8	58.7	58.2	59.8	54.6	54	61.5
19	00.00 – 01.00	57.9	59	60.6	56.8	57.6	62.6	60	54.3	59.8	52.8	54.2	61.4
20	01.00 – 02.00	53.9	59.5	56.7	58.1	57.8	60.4	57	58.4	59.8	53.1	53.3	62.7
21	02.00 – 03.00	53.1	59.4	60.2	56.9	55.2	62.7	62.1	57.4	60.1	56	50.4	60.8
22	03.00 – 04.00	60.1	57.6	63.6	54.3	55.7	63.1	60.5	58.9	61.2	54.8	53.2	64.6
23	04.00 – 05.00	58.1	56.4	62.8	57.6	53.3	64.7	55.1	57.8	65	56.3	53.5	63
24	05.00 – 06.00	54.7	58.2	62.2	55.3	58	64.2	61.1	58.3	67.6	56.5	53	65.9





Location		IN TERMINAL GATE					
Month & Year		PORT OPERATING BUILDING					
Parameter & Unit		Jan - 21	Feb - 21	Mar - 21	Apr - 21	May - 21	Jun - 21
S.No	Time of Sampling	Leq	Leq	Leq	Leq	Leq	Leq
1	06.00 – 07.00 (Day)	58.1	56.9	67.9	68.4	63.6	69
2	07.00 – 08.00	64.7	60.7	67	65.6	66.1	68.5
3	08.00 – 09.00	68.9	63.7	66.3	63.3	63.1	66.1
4	09.00 – 10.00	67.5	60.6	65.9	64.1	63	61
5	10.00 – 11.00	66.6	65.5	65.6	65.6	65.6	67.2
6	11.00 – 12.00	73.7	67.6	69.6	66.4	61.2	69.4
7	12.00 – 13.00	73.6	68.2	69.3	63.7	67.8	72.1
8	13.00 – 14.00	69	69.3	68	64.2	61.9	73.8
9	14.00 – 15.00	71.7	66.5	66	67	65	69.4
10	15.00 – 16.00	74	64.3	66.2	64.8	64.9	72.6
11	16.00 – 17.00	66.7	61.4	70.2	68	59.3	72.4
12	17.00 – 18.00	57.5	61.8	62.2	69.3	59.7	72
13	18.00 – 19.00	57.2	60.9	61.8	64.9	60.3	58.4
14	19.00 –20.00	57.5	65.1	63.6	67.2	60.1	60.2
15	20.00 – 21.00	58	67.9	61.5	65.3	62	58.1
16	21.00 – 22.00	58.4	63.2	65.6	62.5	57	62.6
17	22.00 – 23.00 (Night)	58.3	62.2	67.6	60.8	55.8	63.4
18	23.00 – 00.00	58.9	61.1	64.5	63.1	57.3	62.2
19	00.00 – 01.00	58.2	60.4	60.9	61.9	56.6	64
20	01.00 – 02.00	59	59.3	62.8	60.4	57	62.7
21	02.00 – 03.00	57.5	58.9	67.5	64.7	56.2	59.8
22	03.00 – 04.00	58.9	62.3	65.4	63.2	58.5	62.6
23	04.00 – 05.00	58	58.5	63.7	62.4	60.9	63.4
24	05.00 – 06.00	60	58.9	68.6	65.6	59.7	65.3



Ambient Air Quality Standards in respect of Noise

Area Code	Category of Area / Zone	Limits in dB(A) Leq*	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

Note:- 1. Day time shall mean from 6.00 a.m. to 10.00 p.m.
2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
3. Silence zone is an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority
4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

* dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

A "decibel" is a unit in which noise is measured.

"A", in dB(A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq: It is an energy mean of the noise level over a specified period.

iv. DG SET EMISSIONS

Sampling of Flue gas emission of 1500 KVA DG Set was done and its emissions were determined along with its noise intensity. The Detailed report has been is enclosed as Annexure - 4

DETAILS OF EMISSION MONITORING LOCATIONS

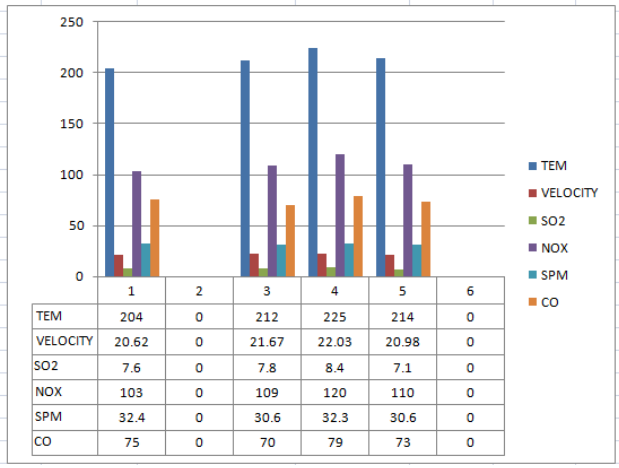
STATION CODE	LOCATIONS	Geographical Location
SM – 1	DG – 1 1500 KVA	13^0 16' 12" N 80^0 20' 5" E
SM – 2	DG – 2 1500 KVA	
SM – 3	DG 125 KVA	13°16'13.33" N 80°20'6.64" E

Annexure - 4

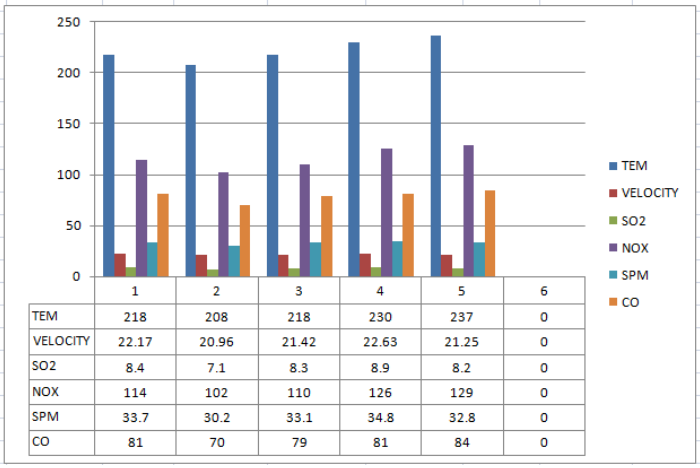
STACK MONITORING													
Location		DG 125KVA						DG 1500KVA -1					
Month & Year		Jan - 21	Feb - 21	Mar -	Apr - 21	May - 21	Jun - 21	Jan - 21	Feb - 21	Mar - 21	Apr - 21	May - 21	Jun - 21
S.N	Parameter												
1	Stack Temperature, °C	--	120	--	127	122	125	218	208	218	230	237	--
2	Flue Gas Velocity, m/s	--	13.98	--	12.02	11.43	12.19	22.17	20.96	21.42	22.63	21.25	--
3	Sulphur Dioxide, mg/Nm3	--	4	--	4.6	4.4	4.7	8.4	7.1	8.3	8.9	8.2	--
4	NOX (as NO2) in ppmv	--	83	--	87	80	86	114	102	110	126	129	--
5	Particular matter, mg/Nm3	--	12.6	--	13.9	14.5	13	33.7	30.2	33.1	34.8	32.8	--
6	Carbon Monoxide, mg/Nm3	--	25	--	30	33	36	81	70	79	81	84	--
7	Gas Discharge, Nm3/hr	--	671	--	568	547	580	6049	5837	5869	6053	5606	--

STACK MONITORING													
Location		DG 1500KVA - 2						DG 1500KVA - 3					
Month		Jan - 21	Feb -	Mar - 21	Apr - 21	May - 21	Jun - 21	Jan - 21	Feb - 21	Mar - 21	Apr - 21	May - 21	Jun - 21
S.N	Parameter												
1	Stack Temperature, °C	215	221	227	221	228	220	204	--	2	225	214	--
2	Flue Gas Velocity, m/s	22.58	21.74	22.19	20.98	21.43	19.52	20.62	--	21.67	22.03	20.98	--
3	Sulphur Dioxide, mg/Nm3	8.2	7.8	8.6	8	7.8	8.3	7.6	--	7.8	8.4	7.1	--
4	NOX (as NO2) in ppmv	110	116	121	115	122	118	103	--	109	120	110	--
5	Particular matter, mg/Nm3	31.9	30.4	35	33.1	35.4	32.1	32.4	--	30.6	32.3	30.6	--
6	Carbon Monoxide, mg/Nm3	78	73	77	75	80	74	75	--	70	79	73	--
7	Gas Discharge, Nm3/hr	6197	5895	5917	5714	5755	5327	579	--	6011	5951	5796	--

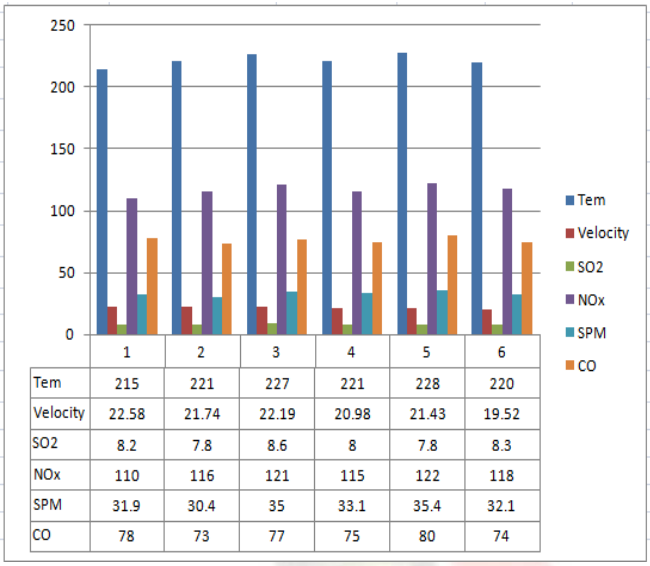
Note : --- DG not in operation.



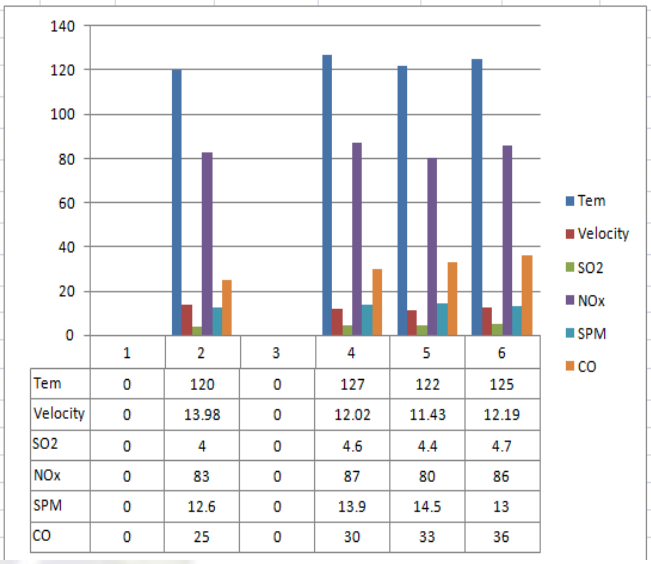
	1	2	3	4	5	6
TEM	204	0	212	225	214	0
VELOCITY	20.62	0	21.67	22.03	20.98	0
SO2	7.6	0	7.8	8.4	7.1	0
NOX	103	0	109	120	110	0
SPM	32.4	0	30.6	32.3	30.6	0
CO	75	0	70	79	73	0



	1	2	3	4	5	6
TEM	218	208	218	230	237	0
VELOCITY	22.17	20.96	21.42	22.63	21.25	0
SO2	8.4	7.1	8.3	8.9	8.2	0
NOX	114	102	110	126	129	0
SPM	33.7	30.2	33.1	34.8	32.8	0
CO	81	70	79	81	84	0



	1	2	3	4	5	6
Tem	215	221	227	221	228	220
Velocity	22.58	21.74	22.19	20.98	21.43	19.52
SO2	8.2	7.8	8.6	8	7.8	8.3
NOx	110	116	121	115	122	118
SPM	31.9	30.4	35	33.1	35.4	32.1
CO	78	73	77	75	80	74



	1	2	3	4	5	6
Tem	0	120	0	127	122	125
Velocity	0	13.98	0	12.02	11.43	12.19
SO2	0	4	0	4.6	4.4	4.7
NOx	0	83	0	87	80	86
SPM	0	12.6	0	13.9	14.5	13
CO	0	25	0	30	33	36

Parameter		Area Category	Total engine rating of the plant (includes existing as well as new generator sets)	Generator sets commissioning date		
				Before 1.7.2003	Between 1.7.2003 and 1.7.2005	On or after 1.7.2005
NO_X (as NO_2) (At 15% O_2, dry basis, in ppmv		A	Up to 75 MW	1100	970	710
		B	Up to 150 MW			
		A	More than 75 MW	1100	710	360
		B	More than 150 MW			
NMHC (as C) (at 15% O_2), mg/Nm^3		Both A and B		150	100	
PM (at 15% O_2), mg/Nm^3	Diesel Fuels- HSD & LDO	Both A and B		75	75	
	Furnace Oils- LSHS & FO	Both A and B		150	100	
CO (at 15% O_2), mg/Nm^3		Both A and B		150	150	

[1] Inserted by Rule 2(b) of the Environment (Protection) Second Amendment Rules, 2008 notified by G.S.R.280(E), dated 11.4.2008.

[2] Serial No.96 and entries relating thereto inserted by Rule 2 of the Environment (Protection) Third Amendment Rules, 2002 notified vide Notification G.S.R.489(E), dated 9.7.2002.

v. STP WATER SAMPLE ANALYSIS

Water samples were collected at the following points.

- 25 KLD Treated Water Outlet

DETAILS OF STP WATER LOCATIONS

STATION CODE	LOCATIONS	Geographical Location
STP – 1	25 KLD	13^0 16' 12" N 80^0 20' 8" E

Analysis results of the water sample collected from the above location are enclosed as Annexure – 5.

Annexure - 5

STP OUTLET WATER													
Location		STP OUTLET						STP INLET					
Month & Year		Jan - 21	Feb - 21	Mar - 21	Apr - 21	May - 21	Jun - 21	Jan - 21	Feb - 21	Mar - 21	Apr - 21	May - 21	Jun - 21
S.No	Parameters												
1	pH @ 25°C	7.63	7.35	7.42	7.36	7.43	7.55	6.89	6.79	7.21	6.97	7.18	7.28
2	Total Suspended	11	22	20	13	10	14	160	160	142	85	74	56
3	BOD at 27°C for 3	8.5	18.0	15.0	11.0	8.4	13.0	159	108	89	71	60	74
4	Fecal Coliform	120	146	123	108	108	142	724	564	510	482	416	510
5	COD	--	--	--	44	32	75	--	--	--	346	30	312
6	Oil & Grease	--	--	--	BDL	BDL	BDL	--	--	--	11	8.2	9.0
7	Total Dissolved Solids	--	--	--	1010	1154	1218	--	--	--	1184	1270	1380
8	Chlorides (as Cl)	--	--	--	248	260	357	--	--	--	286	302	372
9	Sulphates (as SO_4)	--	--	--	14	17	25	--	--	--	10	11	100

vi. DRINKING WATER SAMPLE ANALYSIS

Drinking Water samples were collected at the Canteen or Office Building. Analysis results of the water sample collected from the above location are enclosed as Annexure – 6.

Annexure - 6

DRINKING WATER									
Month & Year		Unit	IS: 10500-1991 R.2012 PERMISSIBLE	Jan - 21	Feb - 21	Mar - 21	Apr - 21	May - 21	Jun - 21
S.No.	Para								
1	pH @ 25°C	-	6.5 - 8.5	7.32	6.77	6.57	6.67	6.76	6.77
2	Total Hardness as CaCo3	mg/L	600	24	22	28	14.0	37	40
3	Chloride as Cl	mg/L	1000	23	25	23	21	76	28
4	Total Dissolved Solids	mg/L	2000	60	70	64	59	184	112
5	Calcium as Ca	mg/L	200	3.2	5.6	4.8	4.8	10	6.4
6	Sulphate as SO4	mg/L	400	4.73	2.33	2.69	2.42	11.0	3.2
7	Total Alkalinity as	mg/L	600	25	40	20	18	35	25
8	Magnesium as Mg	mg/L	1.0	3.84	1.92	3.84	1.92	2.88	5.76
9	Color	Hazen	15	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
10	Odour	-	Unobject	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionabl	Unobjectio
11	Taste	-	Agreeabl	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
12	Turbidity	NTU	5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
13	Nitrate as No3	mg/L	45	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)
14	Iron as Fe	mg/L	0.3	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL
15	Total Residual Chlorine	mg/L	1	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
16	Copper as Cu	mg/L	1.5	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL
17	Manganese as Mn	mg/L	0.3	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL
18	Fluoride as F	mg/L	1.5	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
19	Phenolic compounds as	mg/L	0.002	BDL(DL 0.001)	BDL(DL 0.001)	BDL(DL 0.001)	BDL(DL 0.001)	BDL(DL 0.001)	BDL(DL
20	Mercury as Hg	mg/L	0.001	BDL(DL 0.001)	BDL(DL 0.001)	BDL(DL 0.001)	BDL(DL 0.001)	BDL(DL 0.001)	BDL(DL
21	Cadmium as Cd	mg/L	0.003	BDL(DL 0.003)	BDL(DL 0.003)	BDL(DL 0.003)	BDL(DL 0.003)	BDL(DL 0.003)	BDL(DL
22	Selenium as Se	mg/L	0.01	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL
23	Arsenic as As	mg/L	0.05	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL
24	Lead as Pb	mg/L	0.01	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL
25	Zinc as Zn	mg/L	15	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL
26	Anionic Detergents as	mg/L	1.0	Nil	Nil	Nil	Nil	Nil	Nil
27	Total Chromium as Cr	mg/L	0.05	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL
28	Phenolphthalein Alkalinity as $CaCO_3$	mg/L	---	Nil	Nil	Nil	Nil	Nil	Nil
29	Aluminium as Al	mg/L	0.2	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL
30	Boron as B	mg/L	1.0	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
31	Mineral Oil	mg/L	0.5	Nil	Nil	Nil	Nil	Nil	Nil
32	Polynuclear Aromatic Hydrocarbons as	mg/L	0.0001	Nil	Nil	Nil	Nil	Nil	Nil
33	Pesticides	mg/L	------	Nil	Nil	Nil	Nil	Nil	Nil
34	Cyanide as CN	mg/L	0.05	BDL (DL : 0.01)	BDL (DL : 0.01)	BDL (DL : 0.01)	BDL (DL : 0.01)	BDL (DL : 0.01)	BDL (DL :
35	E. coli	MPN/100ml	Absence	Absence	Absence	Absence	Absence	Absence	Absence
36	Total Coliform	MPN/100ml	Absence	Absence	Absence	Absence	Absence	Absence	Absence

Remarks: The analysis report reveals that the water sample is meeting the criteria for Drinking water standard IS: 10500-1991 R.2012

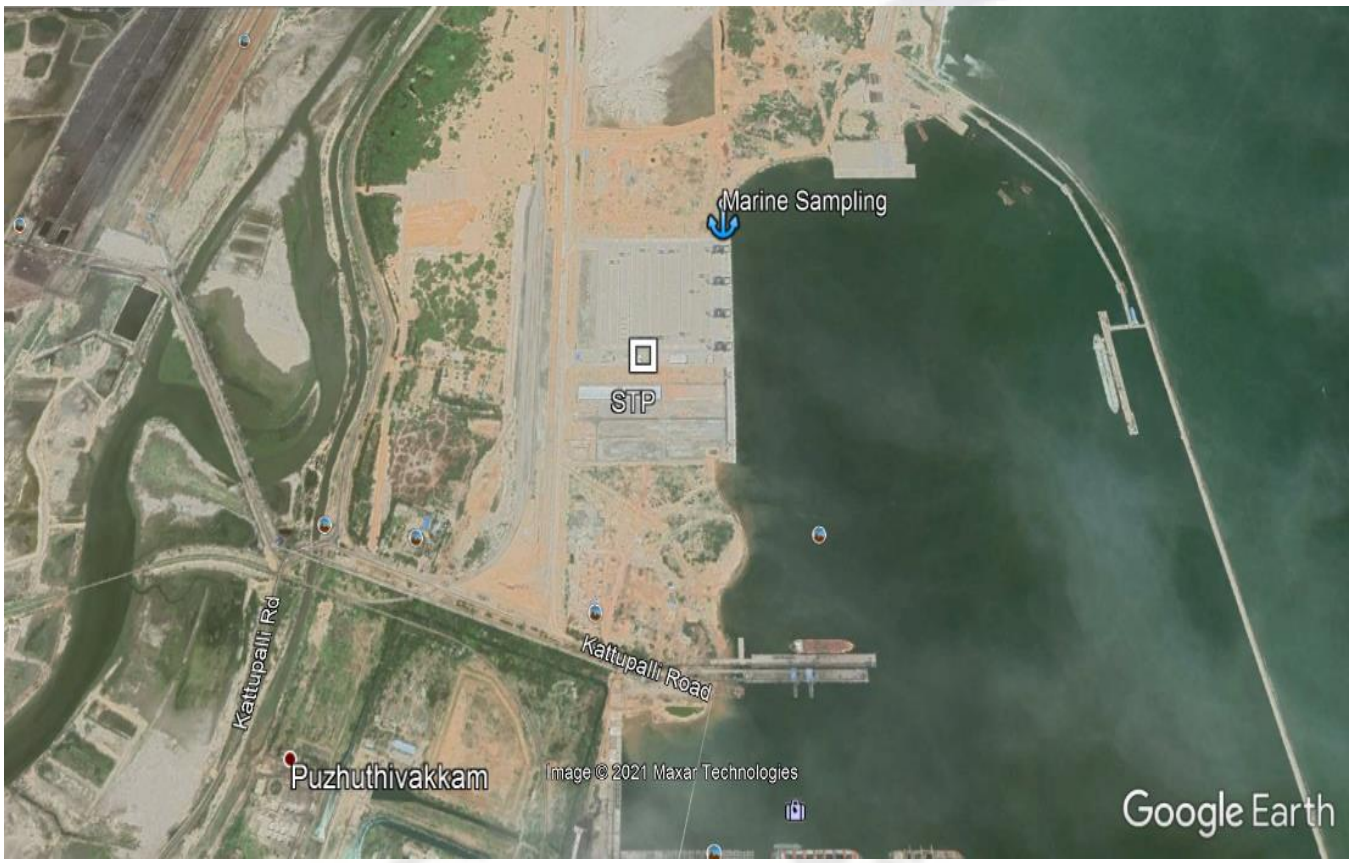
vii. Marine Sampling

Marine Water samples and sediment samples were collected at locations South side berth and North side berth. Analysis data of Marine and sediments as represented in Annexure – 7 & 8.

DETAILS OF MARINE WATER AND SEDIMENT LOCATIONS

STATION CODE	LOCATIONS	Geographical Location
MW – 1 / MS – 1	Bollard	13^0 16’ 25” N 80^0 20’ 16” E

Fig – 4. Water and Marine Sampling Locations



Annexure - 7

MARINE WATER					
Location		Surface Water			
Month & Year		Unit	Jan - 21	Feb - 21	Mar - 21
S.No.	Parameters		Bollard 21	Bollard 02	Bollard 02
1	pH @ 25°C	-	8.16	8.24	8.36
2	Temperature	^{O}C	29	29	29
3	Total Suspended Solids	mg/L	14	10	14
4	BOD at 27 ^{O}C for 3 days	mg/L	9.2	4	4.2
5	Dissolved oxygen	mg/L	4.3	4.1	2.9
6	Salinity at 25 ^{O}C	ppt	32.8	30	31.8
7	Oil & Grease	mg/L	BDL(DL 1.0)	BDL(DL 1.0)	BDL(DL 1.0)
8	Nitrate as No_3	mg/L	4.21	4.86	4.12
9	Nitrite as No_2	mg/L	1.53	1.85	1.73
10	Ammonical Nitrogen as N	mg/L	BDL(DL 1.0)	BDL(DL 1.0)	BDL(DL 1.0)
11	Ammonia as NH3	mg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
12	Kjeldahl Nitrogen as N	mg/L	BDL(DL 1.0)	BDL(DL 1.0)	BDL(DL 1.0)
13	Total phosphates as PO4	mg/L	4.2	4.93	5.64
14	Total Nitrogen	mg/L	BDL(DL 1.0)		
15	Total Dissolved Solids	mg/L	34216	36290	37148
16	COD	mg/L	127	168	152
17	Total bacterial count	cfu/ml	101	143	120
18	Coliforms	Per 100 ml	Absence	Absence	Absence
19	Escherichia coli	Per 100 ml	Absence	Absence	Absence
20	Salmonella	Per 100 ml	Absence	Absence	Absence
21	Shigella	Per 100 ml	Absence	Absence	Absence
22	Vibrio cholerae	Per 100 ml	Absence	Absence	Absence
23	Vibrio parahaemolyticus	Per 100 ml	Absence	Absence	Absence
24	Enterococci	Per 100 ml	Absence	Absence	Absence
25	Octane	µg/L	144	169	175
26	Nonane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
27	Decane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
28	Undecane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
29	Tridecane	µg/L	8.9	8.3	7.7
30	Tetradecane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
31	Pentadecane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
32	Hexadecane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
33	Octadecane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
34	Nonadecane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
35	Elcosane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)

Surface Water								
Month & Year			Jan - 21	Feb - 21	Mar - 21	Apr-21	May-21	Jun-21
S.No.	Parameters	Unit	Bollard 21	Bollard 02	Bollard 02	Bollard 21	Bollard 01	Bollard 03
36	Primary Productivity	mg C/m^3 /hr	8.14	8.67	9.41	9.86	9.14	8.26
37	Chlorophylla	mg $/m^3$	6.26	6.02	7.05	7.69	6.37	6.14
38	Phaeophytin	mg $/m^3$	0.62	0.68	0.73	--	--	--
	Phaeopigment	mg $/m^3$	--	--	--	2.43	2.15	2.73
39	Oxidisable Paticular Organic	mg /L	4.78	5.86	5.02	--	--	--
	Total Biomass	ml /100 m3	--	--	--	1.21	1.14	1.48
PHYTOPLANKTON								
40	Bacteriastrum hyalinum	nos/ml	10	17	14	11	13	8
41	Bacteriastrum varians	nos/ml	13	8	10	14	11	15
42	Chaetoceros didymus	nos/ml	11	14	16	10	7	10
43	Chaetoceros decipiens	nos/ml	15	12	18	12	15	11
44	Biddulphia mobiliensis	nos/ml	9	11	15	9	12	14
45	Ditylum brightwellii	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
46	Gyrosigma sp	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
47	Cladophyxis sps	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
48	Coscinodiscus centralis	nos/ml	9	13	8	12	14	16
49	Coscinodiscus granii	nos/ml	20	15	7	8	10	13
50	Cylcotella sps	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
51	Hemidiscus hardmanianus	nos/ml	17	10	13	12	8	12
52	Laudaria annulata	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
53	Pyropacus horologicum	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
54	Pleurosigma angulatum	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
55	Leptocylindrus danicus	nos/ml	22	20	21	24	18	22

56	Guinardia flaccida	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
57	Rhizosolenia alata	nos/ml	24	22	17	13	16	13
58	Rhizosolena impricata	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
59	Rhizosolena semispina	nos/ml	7	9	12	16	18	20
60	Thalassionema nitzschioides	nos/ml	14	7	16	20	23	22
61	Triceratium reticulatum	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
62	Ceratium trichoceros	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
63	Ceratium furca	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
64	Ceratium macroceros	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
65	Ceracium longipes	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
	ZOOPLANKTONS							
66	Acrocalanus gracilis	nos/ml	13	15	10	12	14	12
67	Acrocalanus sp	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
68	Paracalanus parvus	nos/ml	16	18	13	8	11	8
69	Eutintinus sps	nos/ml	10	7	15	19	16	10
70	Centropages furcatus	nos/ml	15	17	6	11	8	11
71	Corycaeus dana	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
72	Oithona brevicornis	nos/ml	18	13	16	19	13	7
73	Euterpina acutifrons	nos/ml	12	18	9	13	10	14
74	Metacalanus aurivilli	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
75	Copipod nauplii	nos/ml	17	8	14	10	18	20
76	Cirripede nauplii	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
77	Bivalve veliger	nos/ml	9	6	17	14	17	19
78	Gastropod veliger	nos/ml	7	14	20	23	20	13

Location			Bottom Water		
Month & Year		Unit	Jan - 21	Feb - 21	Mar - 21
S.No.	Parameters		Bollard 21	Bollard 02	Bollard 02
1	pH @ 25°C	-	8.27	8.31	8.39
2	Temperature	^{O}C	29	29	29
3	Total Suspended Solids	mg/L	18	13	17
4	BOD at 27 oC for 3 days	mg/L	11	11	4.2
5	Dissolved oxygen	mg/L	4.5	4	3
6	Salinity at 25 oC	-	32.2	29.6	30.8
7	Oil & Grease	mg/L	BDL(DL 1.0)	BDL(DL 1.0)	BDL(DL 1.0)
8	Nitrate as No3	mg/L	4.97	4.18	4.96
9	Nitrite as No2	mg/L	1.86	1.74	2.05
10	Ammonical Nitrogen as N	mg/L	BDL(DL 1.0)	BDL(DL 1.0)	BDL(DL 1.0)
11	Ammonia as NH3	mg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
12	Kjeldahl Nitrogen as N	mg/L	BDL(DL 1.0)	BDL(DL 1.0)	BDL(DL 1.0)
13	Total phosphates as PO4	mg/L	5.02	5.8	5.12
14	Total Nitrogen	mg/L	BDL(DL 1.0)	BDL(DL 1.0)	BDL(DL 1.0)
15	Total Dissolved Solids	mg/L	33896	35860	36864
16	COD	mg/L	132	144	156
17	Total bacterial count	cfu/ml	90	98	102
18	Coliforms	Per 100 ml	Absence	Absence	Absence
19	Escherichia coli	Per 100 ml	Absence	Absence	Absence
20	Salmonella	Per 100 ml	Absence	Absence	Absence
21	Shigella	Per 100 ml	Absence	Absence	Absence
22	Vibrio cholerae	Per 100 ml	Absence	Absence	Absence
23	Vibrio parahaemolyticus	Per 100 ml	Absence	Absence	Absence
24	Enterococci	Per 100 ml	Absence	Absence	Absence
25	Colour	Hazan	20	25	20
26	Odour	-	Unobjectionable	Unobjectionable	Unobjectionable
27	Taste	-	Disagreeable	Disagreeable	Disagreeable
28	Turbidity	NTU	8.4	6.9	7.4
29	Calcium as Ca	mg/L	486	600	642
30	Chloride as Cl	mg/L	17824	16389	17049
31	Cyanide as CN	mg/L	BDL(DL 0.01)		
32	Fluoride as F	mg/L	0.93	0.81	0.87
33	Magnesium as Mg	mg/L	1660	1320	1388
34	Total Iron as Fe	mg/L	1.85	1.53	1.24
35	Residual Free Chlorine	mg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
36	Phenolic Compounds as C6H5OH	mg/L	BDL(DL 1.0)	BDL(DL 1.0)	BDL(DL 1.0)
37	Total Hardness as CaCO3	mg/L	8132	7000	7388
38	Total Alkalinity as CaCO3	mg/L	103	115	104
39	Sulphide as H2S	mg/L	BDL(DL 0.5)	BDL(DL 0.5)	BDL(DL 0.5)
40	Sulphate as SO4	mg/L	1998	2423	2596
41	Anionic surfactants as MBAS	mg/L	BDL(DL 1.0)	BDL(DL 1.0)	BDL(DL 1.0)
42	Monocrotophos	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
43	Atrazine	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)

44	Ethion	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
45	Chiorpyrifos	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
46	Phorate	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
47	Mehyle parathion	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
48	Malathion	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
49	DDT (o,p and p,p-Isomers of DDT,DDE	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
50	Gamma HCH (Lindane)	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
51	Alppha HCH	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
52	Beta HCH	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
53	Delta HCH	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
54	Endosulfan (Alpha,beta and sulphate)	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
55	Butachlor	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
56	Alachlor	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
57	Aldrin/Dieldrin	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
58	Isoproturon	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
59	2,4-D	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
60	Polychlorinated Biphenyls (PCB)	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
61	Polynuclear aromatic hydrocarbons	µg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
62	Arsenic as As	mg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
63	Mercury as Hg	mg/L	BDL(DL 0.001)	BDL(DL 0.001)	BDL(DL 0.001)
64	Cadmium as Cd	mg/L	BDL(DL 0.003)	BDL(DL 0.003)	BDL(DL 0.003)
65	Total Chromium as Cr	mg/L	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)
66	Copper as Cu	mg/L	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)
67	Lead as Pb	mg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
68	Manganese as Mn	mg/L	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)
69	Nickel as Ni	mg/L	BDL(DL 0.05)	BDL(DL 0.05)	BDL(DL 0.05)
70	Selenium as Se	mg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
71	Barium as Ba	mg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
72	Silver as Ag	mg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
73	Molybdenum as Mo	mg/L	BDL(DL 0.01)	BDL(DL 0.01)	BDL(DL 0.01)
74	Octane	µg/L	159	167	175
75	Nonane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
76	Decane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
77	Undecane	µg/L	8.4	7.5	8
78	Tridecane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
79	Tetradecane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
80	Pentadecane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
81	Hexadecane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
82	Heptadecane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
83	Octadecane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
84	Nonadecane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
85	Elcosane	µg/L	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)

Bottom Water								
Month & Year			Jan - 21	Feb - 21	Mar - 21	Apr-21	May-21	Jun-21
S.No.	Parameters	Unit	Bollard 21	Bollard 02	Bollard 02	Bollard 21	Bollard 01	Bollard 03
86	Primary Productivity	mg C/m3 /hr	9.9	9.14	9.98	10.42	10.05	10.81
87	Chlorophyll a	mg /m3	7.84	7.38	8.46	8.1	6.89	6.03
88	Phaeophytin	mg /m3	0.76	0.71	0.79	--	--	--
	Phaeopigment	mg /m3	--	--	--	2.79	2.6	3.12
89	Oxidisable Paticular Organic	mg /L	6.01	6.95	6.33	--	--	--
	Total Biomass	ml /100 m3	--	--	--	1.87	1.57	1.75
PHYTOPLANKTON								
90	Bacteriastrum hyalinum	nos/ml	14	20	17	15	16	11
91	Bacteriastrum varians	nos/ml	18	15	12	18	14	18
92	Chaetoceros didymus	nos/ml	13	16	19	13	10	13
93	Chaetoceros decipiens	nos/ml	17	19	22	17	19	15
94	Biddulphia mobiliensis	nos/ml	12	14	18	11	8	12
95	Ditylum brightwellii	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
96	Gyrosigma sp	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
97	Cladophyxis sps	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
98	Coscinodiscus centralis	nos/ml	12	18	11	14	17	19
99	Coscinodiscus granii	nos/ml	24	21	9	10	12	17
100	Cylcotella sps	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
101	Hemidiscus hardmanianus	nos/ml	15	8	15	15	11	14
102	Laudaria annulata	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
103	Pyropacus horologicum	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
104	Pleurosigma angulatum	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
105	Leptocylindrus danicus	nos/ml	26	24	23	25	22	24
106	Guinardia flaccida	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
107	Rhizosolenia alata	nos/ml	27	25	20	17	20	18

108	Rhizosolena impricata	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
109	Rhizosolena semispina	nos/ml	9	11	16	19	21	24
110	Thalassionema nitzschioides	nos/ml	16	9	18	22	25	26
111	Triceratium reticulatum	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
112	Ceratium trichoceros	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
113	Ceratium furca	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
114	Ceratium macroceros	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
115	Ceracium longipes	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
	ZOOPLANKTONS							
116	Acrocalanus gracilis	nos/ml	17	19	14	17	18	15
117	Acrocalanus sp	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
118	Paracalanus parvus	nos/ml	19	21	17	10	14	11
119	Eutintinus sps	nos/ml	13	10	11	14	13	17
120	Centropages furcatus	nos/ml	16	12	8	15	11	14
121	Corycaeus dana	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
122	Oithona brevicornis	nos/ml	20	16	20	22	17	12
123	Euterpina acutifrons	nos/ml	14	20	12	16	12	15
124	Metacalanus aurivilli	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
125	Copipod nauplii	nos/ml	21	11	16	12	16	23
126	Cirripede nauplii	nos/ml	Nil	Nil	Nil	Nil	Nil	Nil
127	Bivalve veliger	nos/ml	11	8	19	18	21	25
128	Gastropod veliger	nos/ml	9	17	22	25	26	20

Marine Water – Surface water and Bottom Water Test Results (Apr - 21 to Jun – 21)

S.NO	PARAMETER	UNITS	Bollard – 13		Bollard – 01		Bollard – 03	
			Apr-21		May-21		Jun – 21	
Physicochemical Parameters			Surface water	Bottom water	Surface water	Bottom water	Surface water	Bottom water
1	Colour	Hazan	20	30	25	35	20	35
2	Odour	-	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
3	pH @ 25°C	-	8.41	8.45	8.22	8.37	7.78	7.91
4	Temperature	°C	29	29	29	29	29	29
5	Turbidity	NTU	11.4	18.6	9.8	17.3	11	19
6	Total Suspended Solids	mg/L	25	27	18	24	15	26
7	BOD at 27 °C for 3 days	mg/L	7.1	5.6	4.6	4.4	4.1	4
8	COD	mg/L	160	168	134	152	126	142
9	Dissolved oxygen	mg/L	2.7	2.8	2.5	2.7	2.7	2.6
10	Salinity at 25 °C	ppt	30.3	27.1	31.4	30.1	32	31.2
11	Oil & Grease	mg/L	BDL (DL : 1.0)	BDL (DL : 1.0)	BDL (DL : 1.0)	BDL (DL : 1.0)	BDL (DL : 1.0)	BDL (DL : 1.0)
Nutrient Parameters								
12	Nitrate as No_3	mg/L	3.08	4.15	3.47	4.91	3.93	5.17
13	Nitrite as No_2	mg/L	1.49	1.78	1.69	2.13	1.98	2.74
14	Ammonical Nitrogen as N	mg/L	BDL (DL : 1.0)	BDL (DL : 1.0)	BDL (DL : 1.0)	BDL (DL : 1.0)	BDL (DL : 1.0)	BDL (DL : 1.0)
15	Total Nitrogen	mg/L	BDL (DL : 1.0)	BDL (DL : 1.0)	BDL (DL : 1.0)	BDL (DL : 1.0)	BDL (DL : 1.0)	BDL (DL : 1.0)
16	Inorganic phosphates as PO4	mg/L	5.01	4.07	4.23	5.67	5.07	6.21
17	Silica as SiO_2	mg/L	3.05	5.12	3.81	6.45	4.21	6.98
18	Particulate Organic Carbon	µgC/L	14	17	16	20	18	23
19	Pertoleum Hydrocarbons	µg/L	BDL (DL : 0.01)	BDL (DL : 0.01)	BDL (DL : 0.01)	BDL (DL : 0.01)	BDL (DL : 0.01)	BDL (DL : 0.01)
Heavy Metals								
20	Cadmium as Cd	mg/L	BDL (DL : 0.003)	BDL (DL :0.003)	BDL (DL : 0.003)	BDL (DL :0.003)	BDL (DL : 0.003)	BDL (DL :0.003)
21	Copper as Cu	mg/L	BDL (DL : 0.05)	BDL (DL : 0.05)	BDL (DL : 0.05)	BDL (DL : 0.05)	BDL (DL : 0.05)	BDL (DL : 0.05)
22	Total Iron as Fe	mg/L	0.53	0.82	0.53	0.82	0.57	0.7
23	Zinc as Zn	mg/L	BDL (DL : 0.01)	BDL (DL : 0.01)	BDL (DL : 0.01)	BDL (DL : 0.01)	BDL (DL : 0.01)	BDL (DL : 0.01)
24	Lead as Pb	mg/L	BDL (DL : 0.01)	BDL (DL : 0.01)	BDL (DL : 0.01)	BDL (DL : 0.01)	BDL (DL : 0.01)	BDL (DL : 0.01)
25	Mercury as Hg	mg/L	BDL (DL : 0.001)	BDL (DL :0.001)	BDL (DL : 0.001)	BDL (DL :0.001)	BDL (DL : 0.001)	BDL (DL :0.001)
26	Nickel as Ni	mg/L	BDL (DL : 0.05)	BDL (DL : 0.05)	BDL (DL : 0.05)	BDL (DL : 0.05)	BDL (DL : 0.05)	BDL (DL : 0.05)
27	Total Chromium as Cr	mg/L	BDL (DL : 0.05)	BDL (DL : 0.05)	BDL (DL : 0.05)	BDL (DL : 0.05)	BDL (DL : 0.05)	BDL (DL : 0.05)
Bacteriological Parameters								
1	Escherichia Coli (ECLO)	cfu/ml	Absence	Absence	Absence	Absence	Absence	Absence
2	Faecal Coliform (FCLO)	cfu/ml	Absence	Absence	Absence	Absence	Absence	Absence
3	Pseudomonas aeruginosa (PALO)	cfu/ml	Absence	Absence	Absence	Absence	Absence	Absence
4	Streptococcus faecalis (SFLO)	cfu/ml	Absence	Absence	Absence	Absence	Absence	Absence
5	Shigella (SHLO)	cfu/ml	Absence	Absence	Absence	Absence	Absence	Absence
6	Salmonella (SLO)	cfu/ml	Absence	Absence	Absence	Absence	Absence	Absence
7	Total Coliform (TC)	cfu/ml	Absence	Absence	Absence	Absence	Absence	Absence
8	Total Viable Count (TVC)	cfu/ml	Absence	Absence	Absence	Absence	Absence	Absence
9	Vibrio cholera (VC)	cfu/ml	Absence	Absence	Absence	Absence	Absence	Absence
10	Vibrio parahaemolyticus (VP)	cfu/ml	Absence	Absence	Absence	Absence	Absence	Absence

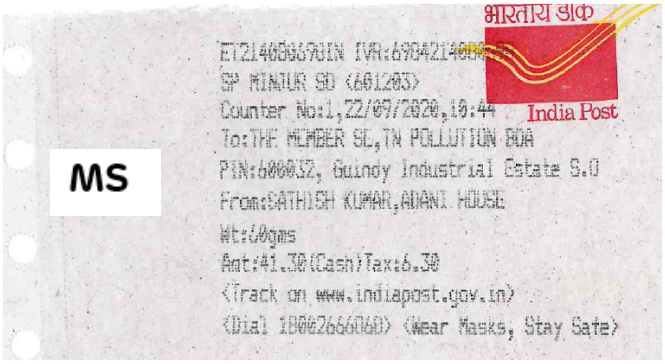
Annexure - 8

SEA SEDIMENT								
Location			Sea Sediment					
Month & Year		Unit	Jan - 21	Feb - 21	Mar - 21	Apr - 21	May - 21	Jun - 21
S.No.	Parameters		Bollard 21	Bollard 02	Bollard 02	Bollard 13	Bollard 01	Bollard 03
1	Total organic matter	%	0.54	0.58	0.64	0.57	0.71	0.74
2	% Sand	%	23	25	22	21	24	25
3	%silt	%	31	28	30	33	31	28
4	%Clay	%	46	47	48	46	45	47
5	Iron (as Fe)	mg/kg	29.3	27.2	20.9	22.8	24.1	26.9
6	Aluminium (as Al)	mg/kg	9127	10004	10186	9864	9437	9811
7	Chromium (as cr)	mg/kg	52	41	27	21	24	20
8	Copper (as cu)	mg/kg	74	65	81	69	75	78
9	Manganese (as Mn)	mg/kg	91	78	65	52	44	51
10	Nickel (as Ni)	mg/kg	26.8	23.2	20.4	17.8	18.2	20.4
11	Lead (as Pb)	mg/kg	34.2	30.6	31.2	26.3	24.7	21.7
12	Zinc (as Zn)	mg/kg	220	203	186	175	186	175
13	Mercury(as Hg)	mg/kg	0.43	0.41	0.37	0.32	0.34	0.31
14	Total phosphorus as P	mg/kg	156	139	150	135	146	152
15	Octane	mg/kg	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
16	Nonane	mg/kg	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
17	Decane	mg/kg	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
18	Undecane	mg/kg	0.87	0.74	0.68	0.7	0.73	0.79
19	Dodecane	mg/kg	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
20	Tridecane	mg/kg	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
21	Tetradecane	mg/kg	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
22	Phntadecane	mg/kg	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
23	Hexadecane	mg/kg	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
24	Heptadecane	mg/kg	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
25	Octadecane	mg/kg	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
26	Nonadecane	mg/kg	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
27	Elcosane	mg/kg	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)	BDL(DL 0.1)
I. Nematoda								
28	Oncholaimussp	nos/m^2	15	12	15	18	13	15
29	Tricomasp	nos/m^2	13	8	12	9	11	8
II. Foraminifera								
30	Ammoniabeccarii	nos/m^2	10	16	10	16	19	12
31	Quinqulinasp	nos/m^2	21	18	14	11	15	17
32	Discorbinellasp.,	nos/m^2	24	15	17	20	23	20
33	Bolivinaspathulata	nos/m^2	22	20	13	17	10	16
34	Elphidiumsp	nos/m^2	18	14	19	13	18	22
35	Noniondepressula	nos/m^2	16	22	20	24	20	21
III. Molluscs-Bivalvia								
36	Meretrixveligers	nos/m^2	27	23	11	19	17	13
37	Anadoraveligers	nos/m^2	25	13	22	25	21	10
	Total No. of individuals	nos/m^2	187	161	153	172	167	154
	Shanon Weaver Diversity Index		2.27	2.26	2.27	2.26	2.27	2.26

adani
Ports and Logistics

AECTPL/TNPCB/2020-21/28

Date: 21/09/2020



To,

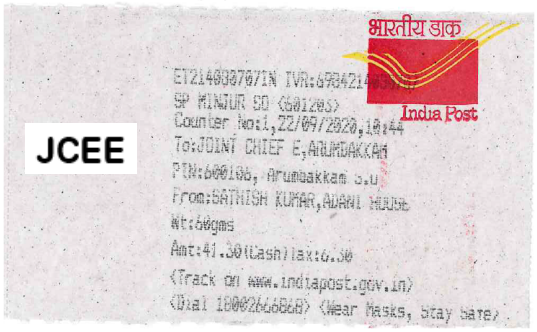
The Member Secretary,
Tamil Nadu Pollution Control Board,
76, Mount Salai,
Guindy,
Chennai – 600 032

Dear Sir,

Sub: Submission of Environmental Statement (Form V) for the financial year ending 31st March, 2020 of Adani Ennore Container Terminal Private Limited, Chennai

Ref: 1. Consent Order No. 1808111676581 under Water Act dated 23.08.2018
2. Consent Order No. 1808211676581 under Air Act dated 23.08.2018

With reference to the captioned subject and cited references above, we submit herewith the Environmental Statement of **M/s Adani Ennore Container Terminal Private Limited,** in Form-V prescribed under Rule 14 of the Environment (Protection) Rules 1986 for the financial year ending 31st March 2020.



Submitted for your kind information and records.

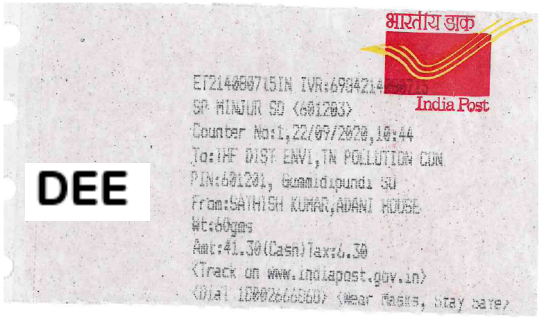
Thanking you,

for **Adani Ennore Container Terminal Private Limited (AECTPL)**

21-09-2020

Jai Khurana
Chief Executive Officer

Adani Ennore Container Terminal Pvt. Ltd. Chennai-



Enclosures: As above

Copy To:

1) The Joint Chief Environmental Engineer, Tamilnadu Pollution Control Board, First Floor, 950/1, Poonamallee High Road, Arumbakkam, Chennai-600 106
2) The District Environmental Engineer, Tamil Nadu Pollution Control Board, Gummidipoondi – 601201.

Adani Ennore Container Terminal Pvt Ltd
Adani House
C/o, Kamarajar Port Limited,
Ponneri Taluk,
Tiruvallur District,
Tamil Nadu – 600 120.

Tel +91 44 2824 3062

info@adani.com
www.adani.com

CIN: U61200GJ2014PTC078795

Sathish Kumar R

From: Sathish Kumar R
Sent: 21 September 2020 12:34
To: 'eccompliance-tn@gov.in'
Cc: Jai Khurana; Milind Sangtiani; 'sravan@kplmail.in'; Vijayasankar K; Prasanth A
Subject: Submission of Environmental Statement (Form V) for the financial year ending 31st March, 2020 of Adani Ennore Container Terminal Private Limited, Chennai- Reg
Attachments: AECTPL - FORM V - FY19-20.pdf

Importance: High

Dear Sir / Madam,

With reference to the captioned subject and cited references above, we submit herewith the Environmental Statement of **M/s Adani Ennore Container Terminal Private Limited, Chennai** in Form-V prescribed under Rule 14 of the Environment (Protection) Rules 1986 for the financial year ending 31st March 2020.

Submitted for your kind information and records.

Thanks and Regards

Sathish Kumar R
Head - Environment
Marine Infrastructure Developer Private Limited | Adani Ennore Container Terminal Private Limited |
Adani Vizag Coal Terminal Private Limited | Adani Mormugao Port Terminal Private Limited |

Mob +91 91760 00959 | Direct: +91 44 2796 8177 | Extn. 69177 |

Form-V

(See rule 14 of Environment (Protection) Rules, 1986)

Environmental Statement for the financial year ending 31st March 2020

Part-A

i)	**Name and Address of the owner / occupier of the industry operation or process**	:	**Mr. Jai Khurana** **Chief Executive Officer** **Adani Ennore Container Terminal Private Limited** **C/O Kamarajar Port Limited** **Vallur Post, Ennore** **Thiruvallur District– 600 120** **Tamil Nadu, India**
ii)	Industry Category	:	**Primary** : Red **Secondary :** 1065 – Ports and Harbour, Jetties and Dredging Operations.
iii)	Production Capacity	:	**Cargo Handling Capacity :** 11.68 MMTPA of Container cargo
iv)	Year of establishment	:	2016
v)	Date of the last environmental statement submitted	:	Vide our Letter No. AECTPL/ENV2019-20/08 dated 20.09.2019

Part –B

WATER AND RAW MATERIAL CONSUMPTION

(i) Water Consumption

S.No	Water Consumption (m^3/Calendar Day)	2018-2019	2019-2020
1	Domestic	7.33	10.93

Adani Ennore Container Terminal Pvt. Ltd. Chennai-

(ii) Raw Material Consumption

S.No.	Name of Raw Material	Name of Products	Consumption of Raw Material per Unit of output	
			During the previous financial year (2018-19)	During the current financial year (2019-20)
1	Not Applicable	Not Applicable	NIL	NIL
The unit does not undergo any manufacturing process. The water consumed is mainly for firefighting, greenbelt development and maintenance, etc.,				

Part-C

POLLUTION DISCHARGE TO ENVIRONEMENT/ UNIT OF OUTPUT
(Parameters as specified in the consent issued)

Pollutants	Quality of Pollutants Discharged (Mass/day)	Concentration of Pollutants discharges (mass/volume)	Percentage of variation from prescribed standards with reason
a) Water	STP Treated Water Characteristics:-		

Parameter	Consent Limit	Actual	% Variation with prescribed standard
pH	5.5-9	7.20	-Nil-
Total Suspended Solids (mg/l)	30	19.08	-Nil-
BOD (3 days at 27°C) (mg/l)	20	13.25	-Nil-

b) Air	DG sets are provided as standby power source and were used during power failure. The Height of DG stacks as per CPCB/ TNPCB Standards. All the monitored parameters are within standards.
Particulate Matter (mg/Nm3)	DG stack emission report is enclosed as **Annexure 1**
Sulphur Dioxide (ppm)	
Nitrogen Oxide (ppm)	

Part-D

HAZARDOUS WASTES

(As specified under Hazardous Waste Management and Handling Rules 1989)

Hazardous Wastes	Total Quantity (Kg)	
	During the previous financial Year (2018-19)	During the current financial Year (2019-20)
(a) From Process	NIL	• Used Oil (5.1) - 10 Tons • Oil from Contaminated filter element (3.3) - 0.5 Tons • Empty Oil barrel (33.1) - 0.5 Tons
(b) From Pollution control facilities	NA	NA

Part-E

SOLID WASTES

Total Quantity Generated			
Solid Waste		During the previous financial Year (2018-19)	During the current financial Year (2019-20)
a)	From process	NIL	NIL
b)	From pollution control facilities- STP	20 kgs	57.28 kgs
c)	1. Quantity recycled or reutilized within the Unit	20 kgs	57.28 kgs
	2. Sold	NIL	NIL
	3. Disposed	NIL	NIL

Part-F

Please specify the characterization (in terms of Composition and quantum) of Hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes:

- Hazardous wastes include Used oil, Filters contaminated with Oil and Empty barrels / containers contaminated with hazardous wastes. All the hazardous wastes are collected and stored properly in Integrated Waste Management Shed & are being disposed to TNPCB authorized /registered recyclers in line to Hazardous Waste Management Rules, 2016 (As amended).

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- The used batteries and E –waste are also stored in Integrated Waste Management Shed and disposed off through approved vendor.
- Hazardous waste Annual returns in Form 4 was submitted in line with the Hazardous and Other Wastes (Management & Trans boundary Movement) Rules, 2016.
- E-waste returns in Form 3 was submitted in line with the E-waste Management Rules 2016
- 100% utilization of STP sludge for greenbelt maintenance as manure.
- All the non-hazardous wastes like paper, wood, metal scraps generated from the terminal are also collected, stored in the Integrated Waste Management Shed and will be handled as per 5R principle.

Part-G

Impact of the pollution abatement measures taken on conservation of natural resources and on the cost of production

- Adani Ennore Container Terminal Private Limited is having electrified cranes only and hence the diesel consumption by the cranes is totally eliminated.
- All the domestic waste water generated at port is treated at existing sewage treatment plant and the treated water is being reused within port premises for gardening/horticulture purpose.
- Sewage Treatment Plant (STP) is in continuous operation and the treated effluent water quality is meeting the TNPCB norms. STP treated water is used for Gardening purpose, thereby reducing freshwater consumption. The total cost spent on STP operation during the year 2019-20 is Rs. 3.60 Lakhs.
- Regular Environmental monitoring is carried out through NABL accredited laboratory. All the monitored environmental parameters are well within the specified limit & the details of monitored data is regularly submitted to TNPCB, CPCB, MoEF&CC and other concerned authorities.
- Unit is continuously developing and maintaining green belt within port premises.
- Implemented Integrated Waste Management System (IWMS) for managing all types of wastes in line with 5R principle.

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Part-H

ADDITIONAL MEASURES/INVESTMENT PROPOSAL FOR ENVIRONMENTAL PROTECTION INCLUDING ABATEMENT OF POLLUTION, PREVENTION OF POLLUTION.

	Description	
	Regular Expenditure (cost in INR lakhs/year)	
1	Environmental monitoring of MOEF recognized third party	7.8
2	Green belt & Horticulture development	22.14
3	Annual maintenance contractor of STP operation	4.20
4	Operation & Maintenance of Integrated Waste Management System	2.40

Part-I

ANY OTHER PARTICULARS IN RESPECT TO ENVIRONMENT

- Working towards achieving "Zero Waste Inventory" as per our Group Environment Policy and all wastes are being handled in line with 5R Principle.
- Energy Conservation Committee to measure the amount of energy consumed and take actions to reduce the energy consumed through port operations
- Carried out mass Tree Plantation of 1000 saplings through "Woodlot Planting Technique".
- Water Warriors committee to identify and reduce the water consumption. The committee would propose innovative water solutions
- Integrated Management System (ISO 9001:2015, 14001:2015 and 45001:2018) certified Port
- Single use and throwaway plastics completely banned inside the port premises.

Date:21.09.2020

(Signature of a person carrying out an industry operation or process)

21/9/2020

Name : **Jai Khurana**
Designation: **Chief Executive Officer**

Address : Adani Ennore Container Terminal Pvt Ltd
C/O Kamarajar Port Limited
Vallur post, Ennore
Thiruvallur District– 600 120.

Annexure - 1

AECTPL- STACK MONITORING (April'2019 to March'2020)													
Location		DG 1500KVA											
		I	II	I	I	I	I	I	I	I	III	III	III
Month & Year		Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
S.No.	Parameters												
1	Stack Temperature, °C	222	210	217	226	215	232	243	246	240	229	235	239
2	Flue Gas Velocity, m/s	16.5	17.45	18.01	19.23	20.14	21.56	23	21.19	20.03	22.43	21.19	21.86
3	Sulphur Dioxide, mg/Nm3	7.5	7	7.9	8.3	7.7	7.2	8	6.8	7.6	7.1	7.8	8.3
4	NOX (as NO2) in ppmv	125	119	125	131	124	140	157	152	143	128	137	140
5	Particular matter, mg/Nm3	31.6	28.9	31.2	33.4	31.3	32.8	30	33.6	29.8	27.5	29.1	33.6
6	Carbon Monoxide, mg/Nm3	64	69	74	80	74	79	71	75	64	69	77	79
7	Gas Discharge, Nm3/hr	4476	4839	4923	5162	5528	5692	5846	5470	5230	5985	5587	5719

AECTPL- STACK MONITORING (April'2019 to March'2020)													
Location		DG 1500KVA											
		II	III	II	II	II	II	II	III	II	II	I	II
Month & Year		Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
S.No.	Parameters												
1	Stack Temperature, °C	214	201	212	220	229	237	229	239	232	237	245	230
2	Flue Gas Velocity, m/s	17.21	15.98	17.42	18.67	19.58	20.41	22	22.74	21.75	20.56	21.81	20.54
3	Sulphur Dioxide, mg/Nm3	6.9	6.2	7.5	8	9.1	8	7	8.1	7.6	7.5	8.5	7.4
4	NOX (as NO2) in ppmv	120	107	119	128	136	144	150	141	143	139	142	133
5	Particular matter, mg/Nm3	34.2	30.5	29	31.9	30.5	33.1	31	32.4	29.8	29.7	31.4	32.8
6	Carbon Monoxide, mg/Nm3	55	63	71	78	72	82	65	68	64	74	70	74
7	Gas Discharge, Nm3/hr	4734	4516	4811	5073	5225	5361	5785	5949	5230	5400	5640	5470

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