Sathish Kumar R

From: Sathish Kumar R
Sent: 28 November 2020 18:33
To: eccompliance-tn@gov.in
Cc: monitoring-ec@nic.in; ssuresh.cpcb@nic.in; Member Secretary, TNPCB; DEE Gummidipoondi; tndoe@nic.in; Jai Khurana; Shalin Shah; Shabdendu Pathak; Vijayasankar K; Prasanth A
Subject: MIDPL - Kattupalli Port, Chennai - Bifurcation of EC&CRZ Clearance vide F. No 10-130/2007 – IA.III - Half Yearly Compliance (Apr'20 to Sep'20) - Reg.
Attachments: MIDPL-HYC-Apr 20 - Sep20.pdf

Importance: High

MIDPL/EC-HYC/2020/39 Date: 27-11-2020

Additional Principal Chief Conservator of Forests (C),
Ministry of Environment, Forest and Climate Change, Regional Office (South Eastern Zone),
Ist and IInd Floor, Handloom Export Promotion Council,
34, Cathedral Garden Road, Nungambakkam,
Chennai – 600 034. Email : eccompliance-tn@gov.in

Dear Sir/Madam,

Sub : Half yearly Compliance report of Environment and CRZ Clearance for the development of proposed Port at Kattupalli, Tiruvallur District of Tamil Nadu by M/s Marine Infrastructure Developer Pvt. Limited for the period of April 2020 to September 2020 – Reg.

Ref : CRZ & Environmental Clearance for the development of proposed Port at Kattupalli, Tiruvallur District of Tamil Nadu by M/s Marine Infrastructure Developer Pvt. Limited – bifurcation of EC&CRZ Clearance vide F. No 10-130/2007 – IA.III dtd . 9th February 2018

With reference to the captioned subject and cited reference above; we herewith submitting the Half yearly compliance report for the compliance period **April 2020 to September 2020** to the conditions stipulated in the cited reference for your kind information.

Thanking you,

For, **M/s. Marine Infrastructure Developer Private Ltd**

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 |

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Ports and Logistics

KATTUPALLI PORT
CHENNAI's NEW GATEWAY

MIDPL/EC-HYC/2020/39

Date: 27-11-2020

Additional Principal Chief Conservator of Forests (C),
Ministry of Environment, Forest and Climate Change, Regional Office (South Eastern Zone),
Ist and IInd Floor, Handloom Export Promotion Council,
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With reference to the captioned subject and cited reference above; we herewith submitting the Half yearly compliance report for the compliance period **April 2020 to September 2020** to the conditions stipulated in the cited reference for your kind information.

Thanking you,

For, **M/s. Marine Infrastructure Developer Private Ltd**

Marine Infrastructure Developer Pvt Ltd. Chennai 600 120

Jai Singh Khurana
Managing Director

Encl: As above

Copy to:

1. The Director (Monitoring –IA-III Division), Ministry of Environment, Forest & Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi – 110003 (Email : monitoring-ec@nic.in)
2. Zonal Office, Central Pollution Control Board, A-Block, Nisarga Bhavan, 1st and 2nd Floors, 7th D Cross, Thimmaiah Road, Shivanagar, Bengaluru, Karnataka 5600879 (Email : ssuresh.cpcb@nic.in)
3. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai - 600 032 (Email : tnpcbmembersecretary@gmail.com)
4. The District Environmental Engineer, Tamil Nadu Pollution Control Board, No.88,SIPCOT Industrial Complex, Gummidipoondi, Tiruvallur District -601 201. (Email : deegummidipoondi@gmail.com)
5. Member Secretary TNCZMA & Director – Dept of Environment, No.1, Jeenis Road, Panagal Building, Ground Floore, Saidapet, Chennai -600 015. (Email : tndoe@nic.in)

Marine Infrastructure Developer Pvt Ltd
(Kattupalli Port)
Kattupalli Village, Ponneri Taluk,
Tirivalluvar District 600 120,
Tamil Nadu, India

Tel +91 44 2824 3062

CIN: U74999TN2016PTC103769

adani Ports and Logistics	Marine Infrastructure Developer Pvt Ltd	From: April 2020 To : September 2020

Status of Conditions Stipulated in Environmental and CRZ Clearance
File no: 10-130/2007- A.III dated: 09/02/2018

Half yearly Compliance report on conditions stipulated in Environmental & CRZ Clearance		
S. No.	**Conditions**	**Compliance Status**
Specific Conditions		
(i)	The proponent shall comply all the conditions stipulated in the letter R.C.No. P1/2004/2008, dated 21.10.2008 of the Department of Environment, Chennai.	**Complied.** Compliance to letter R.C.No. P1/2004/2008, dated 21.10.2008, is enclosed as **Annexure -I.**
(ii)	The proponent shall comply all the commitment made vide his letter No. D/Shipyard/00/07 dated 20.03.2009.	**Complied** This EC is just a bifurcation of original EC of LTSB in name of MIDPL & LTSB. All applicable commitments, w.r.t letter No. D/Shipyard/00/07 dated 20.03.2009 like provision of fire station, independent port connectivity, and no reclamation on areas outside port, non-usage of Tri Butyl Tin [TBT] and treatment of waste water in STP and recycling, disposal of hazardous waste to authorised recyclers are being complied.
(iii)	Provision shall be made for the housing of Construction labour within the site with all necessary infrastructure and facilities such as fuel or cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	**Complied.** All the construction works are completed, and the port is in operation phase.
(iv)	There shall be no withdrawal of groundwater in Coastal Regulation Zone area, for this project. In any case any ground water is proposed to be withdrawn from outside the CRZ area, specific prior permission from the concerned State /Central Groundwater board shall be obtained in this regard.	**Complied.** No groundwater is withdrawal from CRZ Area. Presently unit is procuring Desalinated water from M/s. Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB), Chennai. In case of Groundwater withdrawal outside CRZ Area prior permission will be obtained from State/Central Groundwater Board.

(v)	No dumping of dredging materials in the sea shall be undertaken. In case of sea dumping required, an integrated Modelling study to be carried out to locate the dump site so that it does not cause any problem to Ennore port.	**Complied.** No dumping of dredging material was carried out during the compliance period April 2020 to September 2020. Dredge material dumping location has already been identified by LTSB through modelling studies.
(vi)	Shoreline changes due the project shall be monitored continuously nourishment of northern shoreline shall be carried out using the sediments from beach acceleration on the southern shoreline.	**Complied.** MIDPL has engaged Institute of Ocean Management, Anna University, Chennai for shoreline Change study. Report of the same is submitted along with Half Yearly Compliance Report for the period Oct'19-Mar'20 vide our Letter No. MIDPL / EC – HYC / 2020 / 11 dated 31.05.2020.
(vii)	Suitable Screens shall be installed between the construction area and the intakes so that operations of the intakes are not affected by the construction activity.	**Complied.** Works are completed, and the port is in operation phase. No impact envisaged.
(viii)	At least a distance of 100 meter shall be provided between intake of Chennai Water Desalination Ltd. (CWDL) and north edge of the northern breakwater as agreed in the meeting between the proponent and CWDL	**Complied.** Distance maintained as agreed.
(ix)	Independent port connectivity shall be developed.	**Complied.** An independent port connectivity has been developed.
(x)	Rehabilitation if any shall be carried out as per law / State Government.	**Complied.** Rehabilitation was carried out completely as per law / State Government at the time of project implementation by M/s. LTSB.
(xi)	Fire station shall be located within the project area	**Complied.** MIDPL is having dedicated fire station with fire tender and fire crew.

		 
(xii)	The Hazardous waste generated shall be properly collected and handled as per the provisions of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.	**Complied.** Hazardous wastes generated are properly collected and handled inline to Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 as amended. Details of the same are submitted to TNPCB as a part of Hazardous waste annual return (Form 4) on regular basis. Annual Hazardous Waste Return for FY 2019-20 is attached as **Annexure – II.**
(xiii)	The wastewater generated from the activity shall be collected, treated and reused properly.	**Complied.** Domestic wastewater generated are being collected, treated in STP and the entire treated water is reused for green belt maintenance.
(xiv)	Sewage Treatment Facility should be provided in accordance with the CRZ Notification.	**Complied.** Sewage Treatment Plants are provided in accordance with the CRZ notification.
(xv)	No Solid Waste will be disposed of in the Coastal Regulatory Zone area. The Solid Waste shall be properly collected segregated and disposed as per the provision of Solid Waste Management Rules, 2016.	**Complied.** No solid waste is being disposed of in the CRZ area. All the solid waste generated is properly collected, source segregation of all types of Solid Waste is practised and are disposed as per the provision of Solid Waste Management Rules 2016, as amended.

		Integrated waste Management system is in place and all wastes are being handled inline to 5R principle (Reduce, Reuse, Reprocess, Recycle & Recover).  
(xvi)	Installation and operation of DG set if any shall comply with the guidelines of CPCB.	**Complied** 02 no of DG set with 2000 kVA capacity is installed inline to CPCB guidelines. Flue gas analysis report of the DG Set stack for the period Apr-2020 to Sep-2020 is attached as **Annexure III.**
(xvii)	Air quality including the VOC shall be monitored regularly as per the guidelines of CPCB and reported.	**Complied.** Ambient Air Quality Monitoring is being carried out through NABL accredited laboratory. Air Quality Monitoring Reports for the period Apr-2020 to Sep-2020 is enclosed as **Annexure-III.** We have also installed Continuous Ambient Air Quality Monitoring Station (Including BTX analyser to monitor VOC). CAAQMS has been connected to TNPCB server and data is transferred on real-time basis. All the parameters are well with the prescribed standards.  

(xviii)	The project proponent shall undertake green belt development all along the periphery of the project area and also alongside the road.	**Complied.** Greenbelt of adequate size has been developed along the periphery of the project area and alongside the road and are being maintained by MIDPL. Till date, 6,050 Nos. of trees has been planted. Around 500 trees planted during the compliance period.    

		 
(xix)	All necessary clearances from the concerned agencies shall be obtained before initiating the project.	**Complied.** The project is in operation after obtaining all the necessary clearances from the concerned agencies.
(xx)	Project proponent shall install necessary oil spill mitigation measures in the shipyard. The details of the facilities provided shall be informed to this Ministry within 3 months from the date of receipt of this letter.	**Complied.** All necessary precaution has been taken to avoid any kind of spillages. Oil Spill Contingency Plan has been prepared and is being followed. Oil spill contingency plan along with list of available oil spill equipment submitted vide our Letter No. MIDPL/TNPCB/GMP/EC-HYC dated 14.05.2018.
(xxi)	No hazardous chemicals shall be stored in the Coastal Regulation Zone area.	**Noted for Compliance**. No hazardous chemical is stored in CRZ Area.
(xxii)	The project shall not be commissioned till the requisite water supply and electricity to the project are provided by the PWD/ Electricity Department.	**Complied.** Requisite permission for Water Supply and Electricity has been obtained from Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB) and Tamil Nadu Electricity Board respectively before commissioning.
(xxiii)	Specific arrangements for rainwater harvesting shall be made in the project design and the rain	**Being Complied.** MIDPL is having Rainwater Collection

	water so harvested shall be optimally utilized.	facilities including Storm Water drains and Rainwater Harvesting Pond. Existing Rainwater Harvesting pond is used for Greenbelt maintenance. Water table is observed to be high in and around the Port area. Feasibility of rainwater harvesting will be explored.     
(xxiv)	The facilities to be constructed in the CRZ area as part of this project shall be strictly in conformity with the provisions of the CRZ Notification, 2011 and its amendment. The facilities such as office building and residential buildings which do not require water front and foreshore facilities shall not be constructed within the Coastal Regulation Zone area.	**Complied.** All construction has been done in line to CRZ Notification, 2011 & EC&CRZ clearance obtained.

General Conditions:		
(i)	Construction of the proposed structures shall be undertaken meticulously conforming to the existing Central/local rules and regulations including Coastal Regulation Zone Notification 1991 & its amendments. All the construction designs /drawings relating to the proposed construction activities must have approvals of the concerned State Government Departments /Agencies.	**Complied.** Project is in operation phase. All construction activity has been done in line to the existing Central/local rules including CRZ Notification, 2011 and EC & CRZ clearance obtained
(ii)	Adequate provisions for infrastructure facilities such as water supply, fuel, sanitation etc. shall 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.** Project is in Operation Phase.
(iii)	The project authorities shall 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 Board and the Union Ministry of Environment and Forests under the Environment (Protection) Act, 1986, whichever are more stringent.	**Complied.** No solid waste is being disposed of in the CRZ area. Integrated waste Management system is in place. All the solid waste generated is properly collected, source segregation of all types of Solid Waste is practised and are disposed as per the provision of Solid Waste Management Rules 2016, as amended. Sewage Treatment Plants (STPs) are provided for treatment of wastewater in line to CRZ Notification 2011. Regular Environment Monitoring is being carried out through NABL accredited agency. Monitoring Reports for the period Apr-2020 to Sep-2020 are enclosed as **Annexure –III.** All the monitoring results are well within the prescribed standard.

(iv)	The proponent shall obtain the requisite consents for discharge of effluents and emissions under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (prevention and Control of Pollution) Act, 1981 from the Tamil Nadu State Pollution Control Board before commissioning of the project and a copy of each of these shall be sent to this Ministry.	**Complied.** Requisite Consents for discharge of effluents and emissions under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (prevention and Control of Pollution) Act, 1981 were obtained before commissioning of the project and submitted to Ministry. Project is in operation phase and Consent to Operate has been obtained from the Tamil Nadu State Pollution Control Board vide **Consent Order No. 1907125448424 & 1907225448424 dated 05/07/2019 valid till 31.03.2021.**
(v)	In order to carry out the environmental monitoring during the operational phase of the project, the project authorities shall establish an environmental laboratory well equipped with standard equipment and facilities and qualified manpower to carry out the testing of various environmental parameters.	**Complied.** MIDPL is having Environmental Management Cell, staffed with qualified personnel at site supported by team at Head Office in Ahmedabad. Environment monitoring is being carried out through NABL accredited Laboratory.
(vi)	The proponents 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.** Domestic Wastewater is being treated in STP's and inlet & outlet characteristic of water is regularly analysed by NABL accredited laboratory. The monitoring results for the period Apr-2020 to Sep-2020 is enclosed as **Annexure - III**. All the results are found well within the prescribed standard. Records are made available at site for inspection of State / Central officials during their visit.
(vii)	The sand dunes and mangroves, if any, on the site shall not be disturbed in any way.	**Complied.** No Sand dune and mangroves are present on the site.

<table>
<tr><td>(viii)</td><td>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.</td><td>Complied.

This EC is just a bifurcation of original EC of LTSB.</td></tr>
<tr><td>(ix)</td><td>The Tamil Nadu Pollution Control Board shall display a copy of the clearance letter at the Regional Office, District Industries Centre and Collector's Office/Tehsildars Office for 30 days.</td><td>Complied.

The condition does not pertain to project proponent</td></tr>
<tr><td>(x)</td><td>The funds earmarked for environment protection measures shall be maintained, in a separate account and there shall be no diversion of these funds for any other purpose. A year-wise expenditure on Environmental safeguards shall be reported to this ministry</td><td>Complied.

Separate budget for the Environment Protection is earmarked every year. All the expenses are recorded in advanced accounting system of the organization.

Expenditure for Environment Management measures during Apr-2020 to Sep-2020 is Rs. 69.88 Lakhs. The breakup details are as follows;

<table>
<tr><th>S. No.</th><th>Description of Work</th><th>Cost (Rs.) in Lakhs</th></tr>
<tr><td>1</td><td>Comprehensive Environmental Monitoring</td><td>2.3</td></tr>
<tr><td>2</td><td>AAQ/NL/SM Survey & STP Treated Water Quality analysis</td><td>0.48</td></tr>
<tr><td>3</td><td>Training & Awareness program</td><td>0.2</td></tr>
<tr><td>4</td><td>Integrated Waste Management & Pollution Under Check Facility</td><td>0.7</td></tr>
<tr><td>5</td><td>O&M of STP's</td><td>4.2</td></tr>
<tr><td>6</td><td>Housekeeping</td><td>36.8</td></tr>
<tr><td>7</td><td>Greenbelt Maintenance</td><td>25.2</td></tr>
</table></td></tr>
<tr><td>(xi)</td><td>Full support shall be extended to the officers (this Ministry's Regional Office at Chennai and the officers of the Central and State Pollution Control Boards by the project proponents during their inspection for monitoring purposes, by</td><td>Noted for Compliance.

Full support will be extended to the officers of RO-MoEF & CC Chennai, CPCB & TNPCB during their inspection and site visit. During the compliance period monthly visit was made by TNPCB</td></tr>
</table>

	furnishing full details and action plans including the action taken reports in respect of mitigative measures and other environmental protection activities.	Officials to monitor the compliance and all the necessary support were extended and the same shall be continued in future also.
(xii)	In case of deviation or alteration in the project including the implementing agency, a fresh reference shall be made to this ministry for modification in the clearance conditions or imposition of new ones for ensuring environmental protection.	**Noted for Compliance.** There is no deviation or alteration in the project including implementing agency.
(xiii)	This Ministry reserves the right to revoke this clearance, if any of the conditions stipulated are not complied with to the satisfaction of this Ministry.	**Noted for Compliance.**
(xiv)	This Ministry or any other competent authority may stipulate any other additional conditions subsequently, if deemed necessary, for environmental protection, which shall be complied with.	**Noted for Compliance.**
(xv)	The Project proponents shall inform the Regional Office at Chennai 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.	**Complied.** The same has been Complied by LTSB before bifurcation itself.
EC & CRZ Amendment letter No. 10-130/2007- A.III dated 12.05.2010:		
(i)	The details of combined effect on both the Ports (i.e. Ennore Port and Kattupalli Port) shall be carried out to monitor the impact of the post-dumping. This model study shall be carried out for a period of one year.	**Complied.** M/s LTSB has already carried out detailed modelling study to understand impact of post dumping and report was submitted to Ministry. No dumping was being carried by MIDPL during the period Apr-2020 to Sep-2020. MIDPL engaged Institute of Ocean Management, Anna University to carry out shoreline studies of the concerned area. Reports of the same is submitted along with Half Yearly Compliance Report

		for the period Oct'19-Mar'20 vide our Letter No. MIDPL/EC-HYC/2020/11 dated 31.05.2020.
(ii)	A comparison between model study and actual dumping shall be carried out to examine the impacts both on North-East and South-West of the Ports and shall be submitted to the Ministry,	**Complied.** Comparison between model study and actual dumping was made to examine the impacts and report was submitted to Ministry by LTSB. No dumping was being carried by MIDPL during the period Apr-2020 to Sep-2020. MIDPL engaged Institute of Ocean Management, Anna University for studies. Reports of the same is submitted along with Half Yearly Compliance Report for the period Oct'19-Mar'20 vide our Letter No. MIDPL/EC-HYC/2020/11 dated 31.05.2020.
(iii)	No reclamation of the areas outside the Port limit and Buckingham Canal shall be carried out.	**Being Complied.** No reclamation of the areas outside Port Limit and Buckingham Canal is being carried out.
EC & CRZ Extension of validity letter No. 10-130/2007- XIII dated 17.12.2014:		
(i)	The cargo should only include (i) Container 21.60 MTPA, (ii) Ro-Ro – 0.22 MTPA, (iii) Project cargo – 0.44 MTPA, (iv) Break bulk/General cargo (Barytes/Gypsum/Limestone/Granite/ Steel cargo) – 1.82 MTPA and (v) Edible oil, CBFS, Base oil and Lube oil and non-hazardous liquid cargo - 0.57 MTPA	**Being Complied**.
(ii)	All the conditions stipulated by the Tamil Nadu Coastal Zone Management Authority (TNCZMA) vide letter no. 6064/EC.3/2014-1 dated 26.06.2014, shall be strictly complied with.	**Complied.** All the conditions stipulated by the Tamil Nadu Coastal Zone Management Authority (TNCZMA) vide letter no. 6064/EC.3/2014-1 dated 26.06.2014 are being complied. Compliance status of the same is enclosed as **Annexure – IV.**

(iii)	No additional land should be utilized for the proposed development.	**Complied**
(iv)	As committed, the local traffic should not be disturbed.	**Complied.** Separate road available for local traffic.
5	These stipulations would be enforced among other 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, 991, the Hazardous Chemical (Manufacture, storage and Import) Rules, 1989, Solid Waste Management Rules, 2016 and the Coastal Regulation Zone Notification, 2011 and its subsequent amendments made there under from time to time.	**Noted for Compliance.**
6	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.	**Complied.** All the statutory approvals as applicable have been obtained. Clearance from Chief Controller of Explosives, Fire Department, Civil Aviation Department has been obtained.
7	The project proponent should advertise in at least two local newspapers widely circulated in the region, one of which shall be in the vernacular language informing that the project has been accorded Environmental Clearance and copies of clearance letters are available with the Tamil Nadu Pollution Control Board and may also be seen on the website of the Ministry of Environment and Forests at http://envfonnic.in. The advertisement should be made	**Complied**. Copy of the same is already submitted along with the Compliance report for the period Oct-2019 to Mar-2020.

	within 10 days from the date of receipt of the Clearance letter and a copy of the same should be forwarded to the Regional office of this Ministry at Chennai.	
8	Any appeal against this Environmental Clearance shall lie with the National Environment Appellate Authority, if preferred, within a period of 30 **day** as prescribed under section 11 of the National Environment Appellate Act, 1997.	**Noted.**
9	Status of compliance to the various stipulated environmental conditions and environmental safeguards will be uploaded by the project proponent in its website.	**Complied**. • Six monthly Compliance Report of CRZ & EC Clearance is uploaded on company website regularly (https://www.adaniports.com/ports-downloads) • Environment Statement (Form-V) for the year 2019-2020 was submitted to TNPCB vide letter No. MIDPL/TNPCB/2020-21/32 dated 21.9.2020. Copy of the same is uploaded on Company website and sent to Regional Office of MoEF&CC by e-mail on 21.09.20. Copy of the same is attached as **Annexure VII.**
10	This Environmental and CRZ Clearance is valid till 2" July, 2019.	**Noted.**
11	This issue with the approval of the Competent Authority.	**Noted.**

Enclosures:

Annexure Number	Details of Annexure
Annexure I:	Compliance to RC No. P1/2004/2008, dated 21.10.2008 of Department of Environment, Chennai
Annexure II:	Annual Hazardous Waste Returns – Form IV FY 2019-20.
Annexure III:	Environmental Monitoring reports for the period Apr-2020 to Sep-2020
Annexure IV:	Compliance to TNSCZMA conditions during Apr-2020 to Sep-2020
Annexure V:	Mock Drills carried out during Apr-2020 to Sep-2020
Annexure VI:	EMP Compliance Status
Annexure VII	Environment Statement (Form V) FY 2019-20

adani Ports and Logistics	Marine Infrastructure Developer Pvt Ltd	From : April 2020 To : September 2020

Status of Compliance to RC No. P1/2004/2008, dated 21.10.2008 of Department of Environment, Chennai

Annexure -1

Sl. No	Conditions	Compliance
i	The unit shall carry out dumping/ land filling at dredged material only on land which is not covered under CRZ	**Noted for Compliance**
ii	The unit shall not carry out any ship breaking activity	**Not applicable**
iii	The unit should design that the waste water should be recycled 100% and to be used for developing greenery etc., and there should not be any waste water let out.	**Complied** Domestic waste water generated is being treated in STP's. Treated water is being reused for Horticulture / green belt purpose
iv	The unit should tie - up with institutions like Centre for Environmental Studies or IIT for the periodical monitoring during construction phase so as to ensure the adoption of Safety measures as per the Environmental Management Plan [EMP].	**Complied.** LTSB carried out the studies during Construction Phase.
v	Before commencing construction activities, Proper resettlement for the local the unit should ensure the proper resettlement of local inhabitants residing at the project area to the satisfaction of District Collector and submit a report to the Department of Environment.	**Not applicable.** Complied by M/s. LTSB. Rehabilitation & resettlement was carried out completely as per law / State Government at the time of project implementation. Bifurcation of original CRZ & EC of LTSB obtained vide File no: 10-130/2007- A.III dated 09/02/2018
General Conditions		
a	There should not be any extraction of Ground Water in CRZ.	**Noted for compliance.** No groundwater is withdrawal from CRZ Area. Presently unit is procuring desalinated water from M/s. Chennai Metropolitan Water Supply and Sewerage Board, Chennai.
b	The unit should obtain planning permission for their constructions from the CMDA/Department of Environment before commencing the	**Not applicable.** Project is in operation phase. Bifurcation of original CRZ & EC of LTSB obtained vide File no: 10-

	constructions	130/2007- A.III dated 09/02/2018. Required permission from concerned authorities was taken by M/s. LTSB before commencing the constructions.
c	The proposed activities should not cause coastal erosion and alter the beach configuration	**Complied.** MIDPL has engaged Institute of Ocean Management, Anna University, Chennai for shoreline Change study. Report of the same is submitted along with Half Yearly Compliance Report for the period Oct'19-Mar'20 vide our Letter No. MIDPL / EC – HYC / 2020 / 11 dated 31.05.2020
d	No fencing or barricading along the pipeline alignment and parallel to the coast is permissible in CRZ.	**Agreed for compliance.** All activities permissible as per CRZ notification 2011 & EC&CRZ clearance will only be carried out.
e	No blasting or drilling activities in CRZ is permissible.	**Agreed for compliance.** No blasting or drilling activity is carried in CRZ area. All activities permissible as per CRZ notification 2011 & EC&CRZ clearance will only be carried out.
f	The proponent should not prevent public from easy access to the beach.	**Being complied.** MIDPL will not block the access point to beach for the public.
g	Chemical waste generated and the sewage generated, if any should not be discharged in to the sea.	**Complied.** No chemical waste generated. Sewage waste water generated is being treated in STP's and treated water is used in horticulture / greenbelt maintenance.
h	The proponent should implement the EMP including the Green Belt as envisaged in the EIA report.	**Complied.** The EMP is being implemented in letter & spirit. Adequate Greenbelt has been developed & is being maintained in the port area. Around 6,050 Nos. of trees has been planted as on date. EMP compliance status during Operational Phase is enclosed as **Annexure – VI.**

adani Ports and Logistics	**Marine Infrastructure Developer Pvt Ltd**	**From : April 2020** **To : September 2020**
Status of Compliance to RC No. P1/2004/2008, dated 21.10.2008 of Department of Environment, Chennai		

i	The project activity should not affect the coastal ecosystem including marine flora and fauna.	**Complied** Marine water & Sediment quality are being monitored through NABL accredited laboratory on monthly basis. There is no impact on water quality in the vicinity. The details of Marine Water quality monitoring report for the period April 2020 to September 2020 is enclosed as **Annexure-III**.
j	The proponent should not undertake any activity, which is violate of provisions of CRZ Notification 1991 and the subsequent amendments.	**Being complied.** All activities permissible as per CRZ notification 2011 & EC&CRZ clearance will only be carried out.
k	The CRZ Clearance will be revoked if any of the conditions stipulated in not complied with.	**Noted for compliance**

adani
Ports and Logistics

KATTUPALLI PORT
CHENNAI's NEW GATEWAY

MIDPL/TNPCB/GMP/HWR-2020/15

Date: 22/06/2020

To,

The District Environmental Engineer,
Tamil Nadu Pollution Control Board,
EPIB Building, A.O Block,
Gummidipoondi Industrial Complex,
Gummidipoondi – 601 201.

Dear Sir,

Sub: Submission of Annual Hazardous Waste Returns (FORM 4) for the period April'2019 to March'2020- Reg.

With reference to captioned subject, **M/s. Marine Infrastructure Developer Private Limited** is submitting the Annual Hazardous Waste Returns in Form 4 for the period April'2019 to March'2020.

Submitted for your kind records.

Kindly acknowledge us the receipt of the same.

for, **M/s. Marine Infrastructure Developer Pvt Ltd**

R. Sathish Kumar
Head - Environment

Marine Infrastructure Developer Pvt Ltd Chennai 600 120

Encl: As above

भारतीय डाक India Post
ET025425417IN IVR:698402542[illegible]
SP NORTH CHENNAI THERMAL PP SO <600120>
Counter No:1,24/06/2020,13:08
To:THE DIST ENVI,TN POLLUTION CON
PIN:601201, Gummidipundi SO
From:SATHISHKUMA,HEAD ENVIRONMENT
Wt:110gms
Amt:41.30(Cash)Tax:6.30
<Track on www.indiapost.gov.in>
<Dial 18002666868> <Wear Masks, Stay Safe>

Marine Infrastructure Developer Pvt Ltd
(Kattupalli Port)
Kattupalli Village, Ponneri Taluk,
Tirivalluvar District 600 120,
Tamil Nadu, India

Tel +91 44 2824 3062
CIN: U74999TN2016PTC103769

FORM 4

[See rules 6(5), 13(8), 16(6) and 20 (2)]

FORM FOR FILING ANNUAL RETURNS

[To be submitted to State Pollution Control Board by 30th day of June of every year for the proceeding period April 2019 to March 2020]

1	Name and address of facility:	M/s. Marine Infrastructure Developer Pvt Ltd (MIDPL) Kattupalli Village, Ponneri Taluk, Tiruvallur District - 600120
2	Authorisation No. and Date of issue:	Authorization No. 19HFC20312718 & dated 30.04.2019
3	Name of the authorised person and full address with telephone, fax number and e-mail:	Mr. Jai Khurana Director Marine Infrastructure Developer Pvt Ltd. Kattupalli Village, Ponneri Taluk, Tiruvallur District – 600120. Tel: +91 44 2824 3062. Mail: Jai.Khurana@adani.com
4	Production during the year (product wise), wherever applicable	Not Applicable

Part A. To be filled by hazardous waste generators

1	Total quantity of waste generated category wise	**Cargo residue, washing water and sludge containing Oil**	**Waste containing oil**	**Oil contaminated filter element**
	Category	3.1	5.2	3.3
	Quantity	50.310 Tonnes	0	0
2	Quantity dispatched	-	-	-
	(i) to disposal facility	NIL	NIL	NIL
	(ii) to recycler or co-processors or pre-processor	50.310 Tonnes	0	0
	(iii) others	NIL	NIL	NIL
3	Quantity utilised in-house, if any -	Cargo residue, washing water and sludge containing Oil: **NIL** Waste containing oil: **NIL** Oil contaminated filter element: **NIL**		
4	Quantity in storage at the end of the year –	Oil Sludge: **NIL** Waste containing oil: **NIL** Oil contaminated filter element: **NIL**		

Part B. To be filled by Treatment, Storage and Disposal Facility operators

1	Total quantity received -	Not Applicable
2	Quantity in stock at the beginning of the year -	
3	Quantity treated –	
4	Quantity disposed in landfills as such and after treatment –	
5	Quantity incinerated (if applicable) -	
6	Quantity processed other than specified above -	
7	Quantity in storage at the end of the year -	

Part C. To be filled by recyclers or co-processors or other users

1	Quantity of waste received during the year – (i) domestic sources (ii) imported (if applicable)	Not Applicable
2	Quantity in stock at the beginning of the year -	
3	Quantity recycled or co-processed or used –	
4	Quantity of products dispatched (wherever applicable) –	
5	Quantity of waste generated -	
6	Quantity of waste disposed -	
7	Quantity re-exported (wherever applicable)-	
8	Quantity in storage at the end of the year -	

Metline Infrastructure Developer Pvt Ltd. Chennai 600 120

Date: 22.06.2020
Place: Chennai

Signature of the Occupier

Annexure - 3

REPORT ON

COMPREHENSIVE ENVIRONMENTAL MONITORING

FOR

MARINE INFRASTRUCTURE DEVELOPER PRIVATE LIMITED (MIDPL)
KATTUPALLI VILLAGE, PONNERI TALUK,
THIRUVALLUR DISTRICT, TAMILNADU – 600 120

APRIL 2020 - SEPTEMBER 2020

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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Index for Table

I. INTRODUCTION

Marine Infrastructure Developer Private Limited **(MIDPL)**, subsidiary of Adani Ports and Special Economic Zone Limited (APSEZ) is operating Kattupalli Port, having the latest technology of Terminal Operating System which is the first of its kind in India, which can support the entire supply chain in doing business smoothly.

MIDPL have engaged M/s. Green Chem Solutions (P) Ltd, an Accredited Consultant by NABL to carry out the Comprehensive Environmental monitoring studies in the Port site continuously as per the norms. This report covers the monitored environmental data for the Period April 2020 to September 2020.

II. LOCATION OF THE PROJECT

The Project site is located at Port area, Kattupalli 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 / ETP 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 04 stations for analyzing the following parameters: • PM10 • PM2.5 • SO_2 • NO_2 • CO • Lead • Ozone • Ammonia • Benzene • BenzoPyrene • Arsenic • Nickel	Weekly Twice
3.	Ambient Noise	Collection of Noise levels on hourly basis at 4 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 °C for 3 days • Dissolved oxygen • Salinity at 25 °C • 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,betaandsulphate) • 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	Monthly Once

		• Potassium • 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 – 2 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 02 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**
	RespirableSuspendedParticulateMatter(PM10)	IS5182Part23:2006
	ParticulateMatter PM2.5	GCS/Lab/SOP/087, CPCB Guidelines
	SulphurdioxideasSO$_2$	IS5182 Part2 :2001(Reaff.2006)
	OxidesofNitrogenas NO$_2$	IS5182 Part6 :2006
	LeadasPb	IS5182 Part22:2004(Reaff.2009)
	ArsenicasAs	GCS/Lab/SOP/089, CPCB Guidelines
	NickelasNi	GCS/Lab/SOP/090, CPCB Guidelines
	Carbonmonoxide as CO	IS5182Part10:1999(Reaff.2009
	OzoneasO$_3$	IS5182Part9:1974[Reaff.2009]
	AmmoniaasNH$_3$	GCS/Lab/SOP/086, CPCB Guidelines
	Benzene (α) pyrene	IS 5182 – Part 12
	BenzeneasC$_6$H$_6$	IS5182Part11:2006
3	**Ambient Noise Monitoring**	
	L_{eq} Day & Night	InstrumentManual, 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	**New 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 – Apr 2020 - Sep2020

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 4 locations.
3.	STP water	Collection of STP outlet water at two locations
4.	Ambient Noise	Collection of Ambient noise levels for day and night at 4 locations
5.	Drinking Water	Collection of Drinking water at Canteen Building
6.	Marine Water and Marine Sediments	Collection of Marine water and Marine Sediments at Three locations
7	DG Set Emissions	Collection of DG Set Emissions.

i. METEOROLOGICAL DATA

Meteorological data was collected on hourly basis by installing an auto weather monitoring station at Plant site. The report depicted hereunder represents the data for the period April 2020 to September 2020.

The following parameters were recorded

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

MAY - 2020

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	
01.05.20	28.1	32.2	30.2	1004.7	1009.9	1007.7	SE	0	5.4	3.6	71	91	85.0	0.0
02.05.20	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
03.05.20	28.2	31.0	30.1	1004.8	1008.4	1006.5	SE	0.4	7.2	4.2	83	90	85.7	0.0
04.05.20	27.8	31.2	29.9	1005.7	1009.9	1007.6	SE	0	8.5	4.8	79	91	84.0	0.0
05.05.20	28.9	31.1	30.0	1005.0	1008.8	1007.3	SE	2.2	7.2	5.1	82	90	86.2	0.0
06.05.20	27.3	31	29.7	1005.1	1009.0	1006.9	SE	0.4	6.3	3.8	82	91	85.5	0.0
07.05.20	28.1	31.7	30.3	1005.3	1008.8	1007.1	SE	0	6.3	3.1	80	90	85.4	0.0
08.05.20	28.9	32.1	30.5	1004.6	1008.9	1007.2	SE	0.4	5.4	3.7	73	89	83.8	0.0
09.05.20	28.3	31.3	30.3	1005.2	1009.0	1007.4	SE	0	5.4	3.3	81	90	85.1	0.0
10.05.20	27.3	31.6	30.2	1005.1	1009.5	1007.4	ESE	0	5.4	3.1	80	91	84.5	0.0
11.05.20	27.6	31.5	30.3	1005.9	1010.0	1007.8	ESE	0	4.9	2.6	79	90	83.1	0.0
12.05.20	28.2	32.4	30.2	1005.8	1009.0	1007.2	ESE	0	4.9	2.1	78	89	84.0	0.0
13.05.20	26.9	32.1	29.6	1004.9	1008.4	1006.5	ESE	0	5.8	2.1	74	88	82.9	0.0
14.05.20	27.9	32.6	30.6	1004.2	1007.6	1005.8	ENE	0	2.2	0.8	75	89	82.8	0.0
15.05.20	28.0	33.6	31.0	1002.8	1006.2	1004.5	NNE	0	2.2	0.8	72	90	82.0	0.0
16.05.20	28.4	33.5	30.9	1001.8	1005.5	1003.5	NW	0	4.0	1.8	71	92	83.1	0.0
17.05.20	28.3	34.3	31.3	999.6	1002.2	999.6	WNW	0	4.9	0.6	69	87	76.6	0.0
18.05.20	28.2	34.3	31.3	996.8	1002.2	999.6	NNE	0	4.9	0.6	60	87	76.6	0.0
19.05.20	27.0	39.7	32.2	996.0	1000.5	998.1	SE	0.4	5.8	3.1	44	91	71.5	0.0
20.05.20	30.9	39.6	32.8	997.1	1002.3	999.2	WSW	0	6.3	3.4	43	90	72.1	0.0
21.05.20	30.2	37.1	32.2	999.3	1003.8	1001.7	SSE	1.8	8.5	5.2	55	89	73.2	0.0
22.05.20	29.7	33.3	31.0	1000.8	1005.2	1002.7	SE	2.7	7.6	5.2	66	91	82.9	0.0
23.05.20	29.7	32.7	30.5	1002.2	1005.7	1003.7	SE	0.9	7.6	5.2	74	92	86.8	0.0
24.05.20	29.4	31.1	30.3	1002.8	1007.2	1005.1	SSE	2.7	8	5.4	86	93	89.0	0.0
25.05.20	29.2	31.5	30.2	1004.4	1007.8	1006.3	SE	1.8	6.3	4.4	86	93	89.3	0.0
26.05.20	29.1	31.1	30.1	1003.9	1008.1	1006.3	SE	2.7	6.7	4.6	87	92	90.0	0.0

27.05.20	29.4	31.1	30.2	1002.6	1007.6	1005.5	SSE	3.1	8	5.3	86	94	90.1	0.0
28.05.20	29.2	30.9	30.2	1000.9	1005.7	1003.7	SSE	3.1	7.6	5.5	83	94	89.4	0.0
29.05.20	29.3	32.0	30.3	1001.7	1005.8	1003.8	SSE	1.3	8.5	5.6	72	91	82.1	0.0
30.05.20	28.9	30.9	29.8	1003.0	1007.2	1005.4	SSE	1.8	6.3	5.0	84	93	89.4	0.0
31.05.20	29.3	31.9	29.9	1003.6	1008.7	1006.4	SE	3.1	8.0	5.8	78	92	85.7	0.0

JUNE - 2020

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	
01.06.20	28.8	30.3	29.6	1004.7	1008.5	1006.8	SSE	1.3	6.7	4.1	78	92	87.4	0.0
02.06.20	29.1	32.7	30.0	1003.8	1008.6	1006.2	SSE	1.8	7.6	4.8	71	92	84.9	0.0
03.06.20	28.8	32.9	30.0	1002.7	1007.4	1005.2	SSE	2.2	8.9	5.7	61	91	81.4	0.0
04.06.20	29	32.7	30.1	1002.4	1007.3	1005.0	SSE	2.2	8.5	5.5	67	90	84.1	4.6
05.06.20	28.9	35.3	30.7	1002.6	1007	1005.0	SE	1.3	7.2	3.9	59	92	81.0	0.0
06.06.20	28.8	34.8	30.4	1002.1	1006	1004.2	SSE	0.9	6.7	4.2	61	91	81.0	0.0
07.06.20	28.5	34.7	30.8	1001.5	1005.5	1003.6	SSE	1.3	6.3	3.3	60	90	79.5	0.0
08.06.20	29.6	37.2	32.1	1000.5	1005.4	1003.0	NNE	0	5.8	2.7	51	88	71.8	0.0
09.06.20	29.1	35	31.3	1000.8	1004.5	1002.7	SSE	0.4	5.4	2.5	58	89	76.6	0.0
10.06.20	28.2	32.3	30.6	1000.1	1003.5	1001.8	W	0	4.5	1.4	68	86	77.5	0.2
11.06.20	26.1	31.2	29.1	999.1	1002.7	1001.1	W	0	7.6	2.5	70	93	79.9	0.4
12.06.20	25.4	33.6	29.6	999	1003.3	1000.8	WSW	0.9	6.3	3.0	59	89	73.4	0.0
13.06.20	28.8	36.9	31.6	998.8	1003.4	1001.3	SW	0.4	8.9	3.9	49	85	67.6	0.0
14.06.20	29.3	36.6	31.5	999.9	1004.6	1002.2	SW	1.8	6.3	4.2	56	88	73.0	0.2
15.06.20	29.9	36.6	31.9	999.9	1004.1	1002.3	WSW	0.9	6.3	3.3	55	88	72.6	0.0
16.06.20	29.9	36.6	31.3	999.2	1003.6	1001.6	SSE	1.3	7.6	5.0	54	90	77.7	0.6
17.06.20	28.8	34.6	31.5	1000	1005.6	1003.9	SSE	0.9	5.4	3.6	51	87	73.3	0.2
18.06.20	29.7	34.6	31.5	1001.9	1005.6	1003.9	SW	0	5.4	3.6	59	87	73.3	0.0
19.06.20	29.7	35	31.5	1001.6	1005.6	1004.0	SW	0.9	5.8	3.0	60	86	74.8	0.0
20.06.20	28.8	34.5	31.3	1001.7	1005.3	1003.8	SSE	0	6.7	2.1	62	85	76.5	0.0
21.06.20	27	34.6	30.2	1001.4	1006	1003.3	SSE	0	5.8	1.8	60	90	78.9	6.0
22.06.20	26.6	34.7	29.8	999.6	1004.2	1002.0	SW	0	5.8	2.5	62	92	80.4	0.4
23.06.20	27.1	33.7	29.8	1002	1005.3	1003.6	SW	0.4	6.7	3.1	62	85	77.0	0.0
24.06.20	26.4	31.6	29.2	1002.2	1005.9	1004.4	ESE	0	5.4	2.8	74	86	80.5	0.0
25.06.20	27.4	31.6	29.1	1001.4	1005.5	1003.7	WSW	0	4.9	1.5	76	87	82.6	0.2
26.06.20	27.3	30.3	29.2	1001.6	1004.9	1003.3	SE	0	5.8	3.3	80	88	83.5	0.0
27.06.20	28.6	30.9	29.9	1001.1	1004.9	1003.2	SE	0	6.7	3.7	78	86	82.2	0.0
28.06.20	28.8	31.4	30.1	1000.9	1004.9	1003.2	SSE	0.4	4.9	2.6	79	89	84.5	13.6
29.06.20	27.3	31	29.2	999.9	1004.5	1002.6	SE	0	4.9	2.8	76	88	84.4	0.0
30.06.20	25.6	32.6	29.4	1000.4	1004	1002.4	SSE	0	6.3	3.1	67	94	83.7	34.0

JULY - 2020

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	
01.07.20	26.8	31.9	29.2	1001.4	1005.1	1003.2	SW	0	2.7	1.0	72	91	82.8	2.2
02.07.20	26.8	31.4	29.3	1000.7	1004.6	1002.7	WSW	0	3.6	1.5	72	93	83.2	1.0
03.07.20	26.9	34.4	29.6	999.9	1003.8	1002.0	SW	0.4	5.4	3.4	64	87	78.3	3.2
04.07.20	24.9	31.8	28.1	1000.2	1004.3	1002.3	SSE	0.4	7.6	4.4	71	91	83.2	1.8
05.07.20	27.4	31.9	29.3	1000.4	1004.1	1002.4	SW	0	5.4	3.3	68	90	81.5	0.0
06.07.20	28.3	32.4	29.8	1001	1003.8	1002.2	SW	0.9	4.9	3.3	67	91	80.2	0.0
07.07.20	28.3	34.6	30.3	1002.1	1005.7	1003.7	SE	0.9	5.8	3.6	62	92	80.5	0.0
08.07.20	26.5	32.6	28.9	1002.9	1007	1005.2	SW	0	7.2	3.7	67	89	83.3	0.0
09.07.20	26.9	30.4	28.7	1002.1	1006.8	1004.7	SE	0	5.4	2.7	78	88	83.3	0.0
10.07.20	24.1	32.2	27.9	1002.7	1007.4	1005.3	SSE	0	5.8	2.4	72	94	86.5	2.2
11.07.20	24.8	30.8	28.4	1002.8	1006.7	1004.9	SSE	0	5.8	3.5	75	91	85.1	0.2
12.07.20	26.9	33.2	29.1	1002.4	1006.1	1004.0	SW	0	4.9	2.4	67	88	81.8	0.0
13.07.20	25.3	32.6	28.4	1001.1	1005.1	1003.4	SSE	0	6.3	2.8	72	92	86.3	0.4
14.07.20	27.6	29.9	28.9	1001.9	1004.6	1003.1	SW	0	4.9	2.0	80	89	84.9	0.0
15.07.20	25.7	31.6	29.0	1000.7	1004.2	1002.7	SW	0	4.5	2.3	71	90	83.2	0.0
16.07.20	25.2	30.4	28.2	1000.3	1004.3	1002.3	SW	0	4	1.9	74	93	84.6	2.0
17.07.20	26.2	30.8	29.1	1000.6	1005.5	1004.0	WSW	0	2.7	1.0	68	91	85.1	0.2
18.07.20	26.9	30.8	29.1	1002.6	1005.5	1004.0	SE	0	2.7	1.0	78	91	85.1	0.0
19.07.20	27.2	29.1	28.5	1002.5	1006.7	1004.8	SSE	0	4	1.6	82	91	87.8	0.6
20.07.20	26.3	30.6	29.0	1001.7	1006	1004.3	SSE	0.4	8.5	4.6	77	90	84.3	0.0
21.07.20	28.4	30.3	29.3	1003.2	1006.5	1005.1	SE	0.9	5.8	4.3	83	89	85.9	0.0
22.07.20	28.1	30.9	29.3	1003.3	1006.7	1005.4	SE	2.2	8	5.4	78	88	84.8	0.0
23.07.20	28.1	30.4	29.3	1002.9	1006.2	1004.8	SSE	2.2	8	5.3	75	88	83.9	0.0
24.07.20	27.1	30.9	29.0	1003.4	1007	1005.3	SSE	0	6.3	4.0	73	90	84.6	0.0
25.07.20	25.4	32.4	29.3	1004.8	1008.9	1006.3	S	0.4	4	1.8	74	91	84.2	0.0
26.07.20	25.3	32.4	28.2	1005.2	1009.2	1007.4	SW	0.4	4	1.9	67	89	82.8	1.4
27.07.20	26.7	34.5	30.1	1002.6	1008.2	1005.9	WNW	0	4.5	1.6	61	90	79.7	0.0
28.07.20	27.1	35.3	30.7	1000.6	1005.9	1003.6	SW	0	8	2.4	63	88	77.4	0.0
29.07.20	25.5	28.6	26.7	1001.8	1005	1003.3	SW	0	4.5	1.4	80	94	90.9	2.6
30.07.20	26.6	32.9	29.2	1001.9	1005.4	1003.5	SSW	0	4.9	1.8	72	94	85.1	0.0
31.07.20	27.9	32.6	29.6	1000.7	1005.2	1003.2	SSW	0.9	6.3	3.7	73	89	84.5	0.0

AUGUST - 2020

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	
01.08.20	24.3	31.7	28.2	1001.8	1005.6	1003.5	SW	0	5.8	2.3	76	95	86.4	5.6
02.08.20	25.6	33.2	28.2	999.8	1005.5	1003.2	WSW	0	5.4	2.5	69	92	83.4	3.8
03.08.20	24.5	30	27.6	1000.3	1005.6	1002.5	SW	0.9	4.9	2.5	78	93	85.0	1.8
04.08.20	27.4	31.5	29.3	998.7	1002.1	1000.3	SW	0	4.9	2.6	69	88	77.9	0.0
05.08.20	26.2	31.7	28.7	996.5	1000.6	999.0	SSW	1.3	7.2	4.0	66	87	79.1	0.4
06.08.20	27.9	33.4	29.9	998.8	1002.6	1000.6	SSW	2.2	7.6	4.4	65	90	78.4	0.0
07.08.20	27.8	32.8	29.9	1001.9	1005.3	1003.3	SW	1.3	5.8	3.7	69	91	80.8	0.0
08.08.20	28.1	33	30.4	1001.5	1005.3	1003.6	WSW	0	4	1.6	67	92	79.8	0.0
09.08.20	24.3	30.2	27.4	1001.4	1005.2	1003.2	SW	1.8	7.2	3.6	77	95	85.5	8.6
10.08.20	26.1	32.3	28.6	1002.2	1004.9	1003.7	WSW	0	6.3	2.3	70	89	82.0	0.0
11.08.20	25.7	33.2	29.3	1002.9	1007.2	1004.9	WSW	0	4.9	2.5	67	94	81.0	4.2
12.08.20	26.1	30.8	28.7	1004	1007.6	1005.8	SW	0	2.7	1.3	74	94	84.3	3.8
13.08.20	27.4	31.7	29.3	1001.5	1006.9	1004.2	WSW	0	2.7	1.0	73	87	80.8	0.2
14.08.20	26.9	30.7	28.7	1001.3	1004.7	1003.2	SW	0	3.6	1.3	74	90	82.1	0.0
15.08.20	27.3	30.3	28.9	1002.1	1005.6	1003.6	SW	0.4	3.6	2.2	72	89	78.1	0.0
16.08.20	27	30.3	28.9	1002.6	1005.7	1004.2	N	0	3.6	1.6	70	89	79.5	0.0
17.08.20	27.6	32.6	29.7	1001.3	1005.9	1004.0	SW	0	4	1.6	67	89	80.5	0.0
18.08.20	28.2	32.6	29.7	1002	1005.9	1004.0	N	0	4	1.6	69	89	80.5	0.4
19.08.20	27.4	32.5	29.1	1001	1005.1	1003.2	N	0.4	3.6	1.7	70	90	81.6	0.0
20.08.20	28.2	31.9	29.5	1001.6	1005.2	1002.9	SSE	0.4	4	2.9	67	91	81.8	0.0
21.08.20	27.6	31.4	28.7	1003.4	1007.3	1005.3	SE	0.4	6.7	3.1	70	93	87.6	0.0
22.08.20	27.9	30.3	28.6	1004.8	1008.9	1006.6	SSE	0.9	6.7	3.3	77	95	88.6	0.0
23.08.20	27.7	30.3	28.5	1004.3	1008.3	1006.5	SE	0	5.8	2.5	79	94	87.7	0.0
24.08.20	25.6	30.5	27.7	1005.6	1008.9	1006.9	SE	0.4	4.5	2.3	73	95	88.4	0.0
25.08.20	27	29.3	28.3	1005.9	1009.2	1007.6	SSE	0	2.2	0.6	86	92	88.6	0.0
26.08.20	26.3	32.7	28.6	1005	1008.7	1007.2	SW	0	3.6	2.1	72	93	87.8	0.0
27.08.20	26.7	33.4	29.1	1003.6	1007.9	1005.9	SW	0.9	5.4	2.1	70	90	84.3	0.0
28.08.20	25.6	31.8	28.3	1003.1	1007	1005.2	SE	0	4.5	2.5	74	91	86.3	0.0
29.08.20	28.3	31.7	29.3	1003.3	1007	1005.2	SE	0.4	4.9	2.7	78	90	87.3	5.4
30.08.20	28.2	31.6	29.5	1003.6	1007.9	1005.7	SSE	0	3.1	1.6	80	91	87.2	0.0
31.08.20	26.9	32.6	29.7	1003.5	1008.6	1006.2	NNE	0	3.1	1.3	71	90	81.3	0.0

SEPTEMBER - 2020

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	
01.09.20	27.2	33.6	29.8	1002.5	1007.9	1005.8	WNW	0	3.1	1.3	68	91	79.7	0.0
02.09.20	26.3	30.8	28.6	1003.4	1007.7	1005.5	WNW	0	3.1	0.9	74	88	83.3	0.0
03.09.20	26.9	31.1	29.2	1004.2	1007.9	1006.1	ENE	0	3.6	1.2	79	94	84.7	4.2
04.09.20	26.8	30.8	28.6	1003.8	1008.2	1006.2	ESE	0	3.1	1.0	81	92	86.3	0.0
05.09.20	26.9	31.1	29.2	1003.6	1008.1	1005.5	ENE	0	3.1	1.3	77	91	84.3	0.0
06.09.20	26.8	30.3	29.0	1003.4	1006.6	1005.1	ESE	0	4.5	2.2	80	92	85.3	0.0
07.09.20	26.2	31	28.4	1004.2	1007.3	1005.4	WNW	0	5.4	1.4	80	93	86.3	0.4
08.09.20	25.9	31.7	28.5	1003.6	1007.7	1005.8	SW	0	3.1	1.4	73	91	83.2	0.0
09.09.20	25.8	30.8	28.5	1002	1007.1	1005.0	SSE	0.4	5.4	2.7	80	90	86.8	0.0
10.09.20	25.8	31.6	28.1	1000.6	1006	1003.3	SW	0.9	5.8	2.5	71	92	85.3	0.0
11.09.20	27.9	31.4	29.3	1001.7	1005.6	1003.6	SW	0.9	5.4	3.1	68	89	79.1	0.2
12.09.20	27.3	30.8	29.0	1004.1	1008.3	1005.8	WSW	0.9	4.5	2.3	70	86	77.8	0.0
13.09.20	24.3	27.8	26.1	1003.5	1008.1	1006.1	SW	0	5.4	2.2	82	95	88.9	16.8
14.09.20	24.2	28.3	26.3	1002.6	1007.1	1005.1	WSW	0	3.6	1.6	79	95	87.6	1.0
15.09.20	25.9	30.4	27.7	1002.2	1006.6	1004.5	SW	0	2.7	1.4	73	91	83.9	1.0
16.09.20	26.6	30.7	28.7	1002.9	1006.7	1004.7	SW	0	2.7	1.1	75	92	85.1	0.0
17.09.20	26.7	31.7	29.3	1002.6	1005.5	1003.2	SW	0	2.2	1.0	70	93	83.8	4.2
18.09.20	26.9	31.7	29.3	1000.4	1005.5	1003.2	SW	0	2.2	1.0	74	93	83.8	0.0
19.09.20	23.4	28.8	26.2	999.5	1004.1	1001.9	WSW	0	3.6	1.0	81	96	89.5	37.0
20.09.20	26.7	29.7	27.7	999.3	1002.8	1000.9	SW	1.3	6.7	3.9	76	87	81.3	0.0
21.09.20	27.2	31.2	28.7	1000.2	1004.2	1001.8	SW	2.2	5.4	3.3	72	90	77.3	0.0
22.09.20	27.2	33.6	29.5	1001.3	1004.9	1003.0	SSE	0.4	6.7	3.6	63	90	78.6	0.0
23.09.20	26.8	32.7	29.1	1003.3	1007.1	1005.0	N	0	4	2.6	64	91	78.9	0.0
24.09.20	27.5	32.9	29.5	1005.1	1009.3	1006.8	SE	0.4	3.6	2.0	63	91	82.0	0.0
25.09.20	25.3	30.2	28.3	1004.6	1008.7	1006.9	N	0	5.4	2.4	77	93	87.8	6.4
26.09.20	25.2	29.9	27.8	1004.6	1009.1	1006.8	WSW	0	4	1.2	76	89	83.8	0.0
27.09.20	27.1	31.5	29.0	1004.6	1009.1	1007.1	WSW	0	0.9	0.2	73	90	84.4	0.0
28.09.20	26.6	33.7	29.3	1003.5	1008	1006.2	SW	0.4	3.1	1.2	66	89	82.2	0.0
29.09.20	25.3	33.6	28.1	1001.8	1007.3	1005.2	SW	0	3.6	1.6	68	93	84.5	0.0
30.09.20	24.2	31.8	27.0	1001.8	1006.3	1004.4	SW	0	3.1	1.5	73	95	86.8	15.8

WIND PATTERN - May- 2020

Direction	0 <= ws < 1	1 <= ws < 2	2 <= ws < 3	3 <= ws < 4	4 <= ws < 5	ws >= 5	Total wind Speed (m/s)	Number of events	Events (%)
N	1	0	0	0	0	1	15.6	2	0.3
NNE	13	9	10	0	0	0	6.6	32	4.3
NE	8	1	0	0	0	0	36.6	9	1.2
ENE	10	3	1	0	0	0	8.5	14	1.9
E	2	4	3	2	1	0	1.7	12	1.6
ESE	3	3	5	13	9	8	9.3	41	5.5
SE	5	7	7	44	69	136	0.4	268	36.3
SSE	12	16	19	52	26	56	25.8	181	24.5
S	8	1	3	8	9	3	39.3	32	4.3
SSW	0	1	4	6	6	2	84.9	19	2.6
SW	18	0	1	7	2	1	84.0	29	3.9
WSW	14	4	4	6	1	0	28.2	29	3.9
W	15	1	2	1	2	1	29.0	22	3.0
WNW	12	2	0	3	4	1	24.2	22	3.0
NW	9	5	6	4	2	0	20.9	26	3.5
NNW	1	0	0	0	0	0	20.5	1	0.1
								739	
Number of events	131	57	65	146	131	209	739		
Events (%)	17.7	7.7	8.8	19.8	17.7	28.3			

WIND PATTERN - June- 2020

Direction	0 <= ws < 1	1 <= ws < 2	2 <= ws < 3	3 <= ws < 4	4 <= ws < 5	ws >= 5	Total wind Speed (m/s)	Number of events	Events (%)
N	1	2	3	1	1	15	64.0	23	3.2
NNE	2	1	2	1	0	0	7.1	6	0.8
NE	6	0	0	0	0	0	1.3	6	0.8
ENE	13	6	0	0	0	0	4.4	19	2.6
E	5	4	7	2	0	0	16.9	18	2.5
ESE	6	4	2	12	11	5	43.4	40	5.6
SE	8	2	4	20	30	44	84.9	108	15.1
SSE	5	5	18	39	29	55	85.8	151	21.1
S	3	8	6	8	11	2	34.8	38	5.3
SSW	3	3	6	18	10	1	34.4	41	5.7
SW	28	20	26	32	17	11	53.6	134	18.7
WSW	12	15	16	18	8	0	29.4	69	9.6
W	12	14	5	2	0	0	16.0	33	4.6
WNW	6	5	2	4	2	0	20.9	19	2.6
NW	7	0	1	2	0	2	24.5	12	1.7
NNW	0	0	0	0	0	0	0.0	0	0.0
								717	
Number of events	117	89	98	159	119	135	717		
Events (%)	16.3	12.4	13.7	22.2	16.6	18.8			

WIND PATTERN - July- 2020

Direction	0 <= ws < 1	1 <= ws < 2	2 <= ws < 3	3 <= ws < 4	4 <= ws < 5	ws >= 5	Total wind Speed (m/s)	Number of events	Events (%)
N	0	0	0	0	0	10	34.9	10	1.3
NNE	2	0	0	0	0	0	0.4	2	0.3
NE	7	5	0	0	0	0	4.0	12	1.6
ENE	8	1	0	0	0	0	2.6	9	1.2
E	5	5	1	0	0	0	6.6	11	1.5
ESE	3	2	5	1	4	2	27.3	17	2.3
SE	12	11	11	21	18	40	76.4	113	15.2
SSE	20	16	23	32	32	26	69.7	149	20.1
S	17	7	13	12	5	6	41.1	60	8.1
SSW	12	11	14	12	8	5	48.7	62	8.4
SW	41	20	27	44	17	10	48.6	159	21.5
WSW	20	20	21	11	1	0	24.5	73	9.9
W	18	7	2	5	0	0	13.3	32	4.3
WNW	7	2	2	10	2	0	23.2	23	3.1
NW	3	1	0	4	0	0	6.6	8	1.1
NNW	1	0	0	0	0	0	0.0	1	0.1
								741	
Number of events	176	108	119	152	87	99	741		
Events (%)	23.8	14.6	16.1	20.5	11.7	13.4			

WIND PATTERN - Aug- 2020

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	8	13	18	22	1	4	35.8	66	9.0
NNE	9	3	1	0	0	0	5.3	13	1.8
NE	1	2	0	0	0	0	2.2	3	0.4
ENE	5	1	0	0	0	0	2.2	6	0.8
E	5	2	2	0	0	0	7.1	9	1.2
ESE	9	5	6	8	0	0	20.0	28	3.8
SE	7	14	21	24	8	3	41.9	77	10.5
SSE	13	23	27	36	6	13	61.2	118	16.0
S	12	7	8	6	5	3	43.7	41	5.6
SSW	9	4	15	8	9	12	61.7	57	7.7
SW	48	42	45	50	12	4	48.7	201	27.3
WSW	42	24	9	10	2	0	24.5	87	11.8
W	11	4	2	1	0	0	12.5	18	2.4
WNW	2	3	0	2	0	0	7.6	7	1.0
NW	4	0	1	0	0	0	4.0	5	0.7
NNW	0	0	0	0	0	0	0.0	0	0.0
								736	
Number of events	185	147	155	167	43	39	736		
Events (%)	25.1	20.0	21.1	22.7	5.8	5.3			

WIND PATTERN - Sep- 2020

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	4	6	9	13	4	1	2.88	37	5.2
NNE	3	1	0	0	0	0	0.57	4	0.6
NE	5	0	0	0	0	0	0.65	5	0.7
ENE	15	4	0	0	0	0	0.65	19	2.7
E	6	7	0	0	0	0	1.00	13	1.8
ESE	6	8	20	11	2	1	2.49	48	6.7
SE	11	4	12	13	5	1	2.68	46	6.5
SSE	18	19	24	11	5	8	2.90	85	11.9
S	15	4	5	4	1	1	2.56	30	4.2
SSW	9	5	6	13	2	2	2.96	37	5.2
SW	61	41	40	22	15	10	3.35	189	26.5
WSW	45	31	16	4	1	0	2.09	97	13.6
W	32	6	1	4	0	0	1.66	43	6
WNW	30	12	3	2	0	0	1.78	47	6.6
NW	8	2	1	2	0	0	1.39	13	1.8
NNW	0	0	0	0	0	0	0.00	0	0.0
								713	

Number of events	268	150	137	99	35	24	713
Events (%)	37.6	21.0	19.2	13.9	4.9	3.4	

Wind details Enclosed as	Description of Figure	Geographical Location
Fig - 2	Wind Rose diagram	13^0 16'13" N 80^0 20'4" E
Fig - 3	Average wind speed diagram	
Fig - 4	Distribution of wind direction diagram	
Fig - 5	Distribution of wind speed classes diagram	
Note: Date wise data at the above monitoring stations enclosed as Annexure - 1		

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

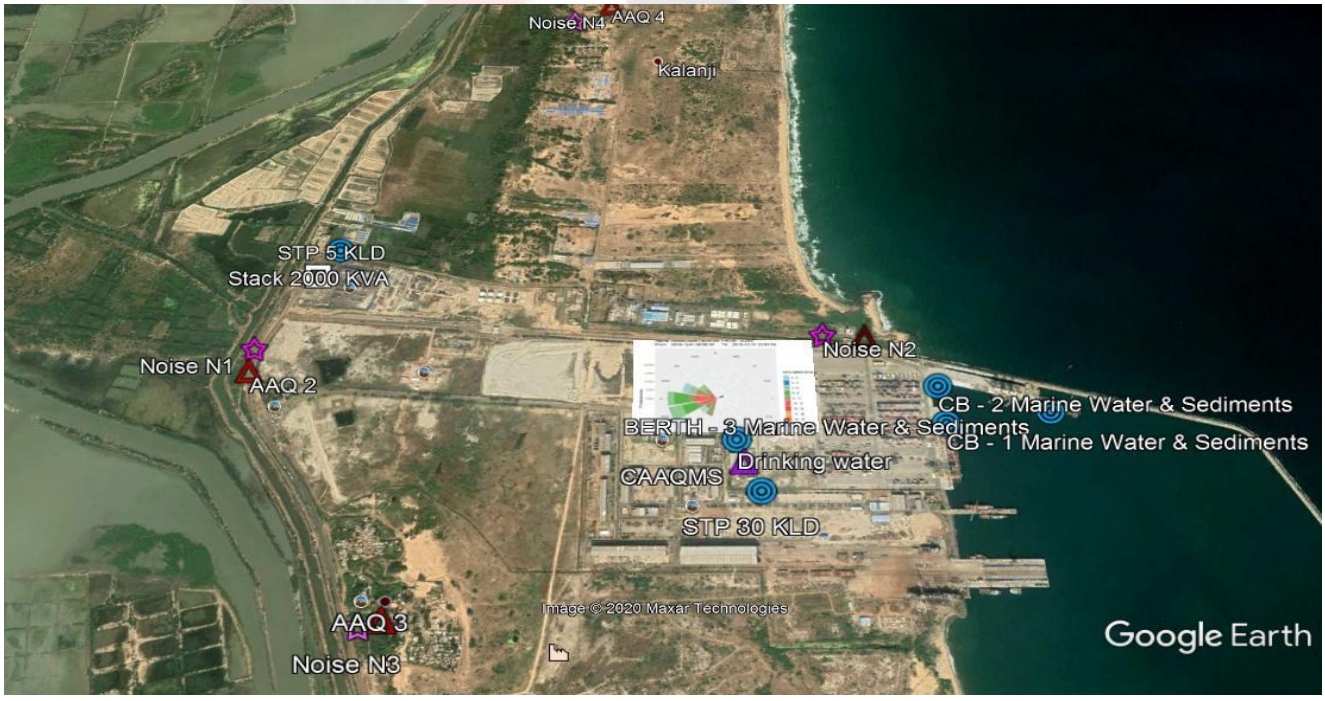
The frequency of monitoring that has been followed for sampling of ambient air quality is that one sample per weekly twice at three locations.

DETAILS OF AMBIENT AIR QUALITY MONITORING LOCATIONS

Station code	Location	Geographical location	Environmental setting
AAQ1	Near Marine Control Tower	13^0 18’55” N 80^0 20’ 45” E	Industrial
AAQ2	Near Port Main Gate	13^0 18’51” N 80^0 19’ 28” E	Industrial
AAQ3	Kattupalli village	13^0 18’18” N 80^0 19’ 48” E	Village
AAQ4	Kalanji village	13^0 20’8” N 80^0 20’ 0” E	Village
CAAQM 1	Port Operating Building	13°18'45.68"N 80°20'25.50"E	Industrial

Fig – 2. AMBIENT AIR SAMPLING STATIONS LOCATION MAP

Fig.3.AMBIENT AIR SAMPLINGS STATIONS WITH RESPECT TO WIND



TECHNIQUES USED FOR AMBIENT AIR QUALITY MONITORING

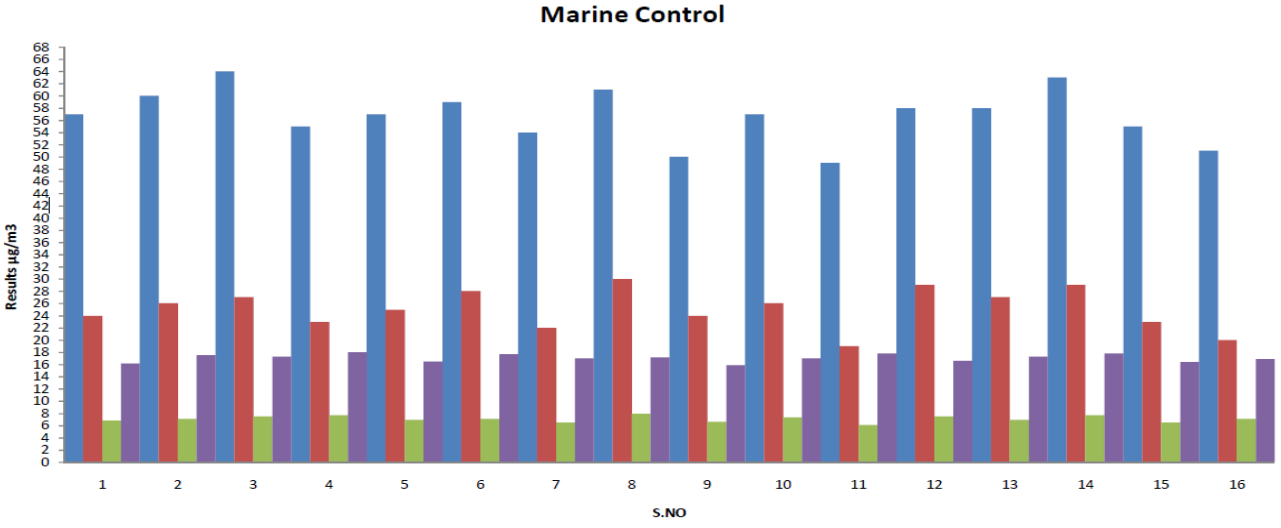
S.No	Parameter	Technique	Unit	Minimum Detectable Limit
1	PM_{10}	Respirable Dust Sampler (Gravimetric method)	$\mu g/m^3$	1.0
2	$PM_{2.5}$	Fine particle Sampler (Gravimetric method)	$\mu g/m^3$	5.0
3	Sulphur Dioxide	Modified West and Gaeke method	$\mu g/m^3$	4.0
4	Nitrogen Oxide	Jacob &Hochheiser method	$\mu g/m^3$	6.0

S.No	Parameter	Technique	Unit	Minimum Detectable Limit
5	Lead	Atomic Absorption Spectrometry	µg/m^3	0.5
6	Carbon Monoxide	Draggers Tube	mg/m^3	0.1
7	Ozone	UV Photometric	µg/m^3	2.0
8	Ammonia	Indophenol blue method	µg/m^3	2.0
9	Benzene	Gas Chromatography	µg/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

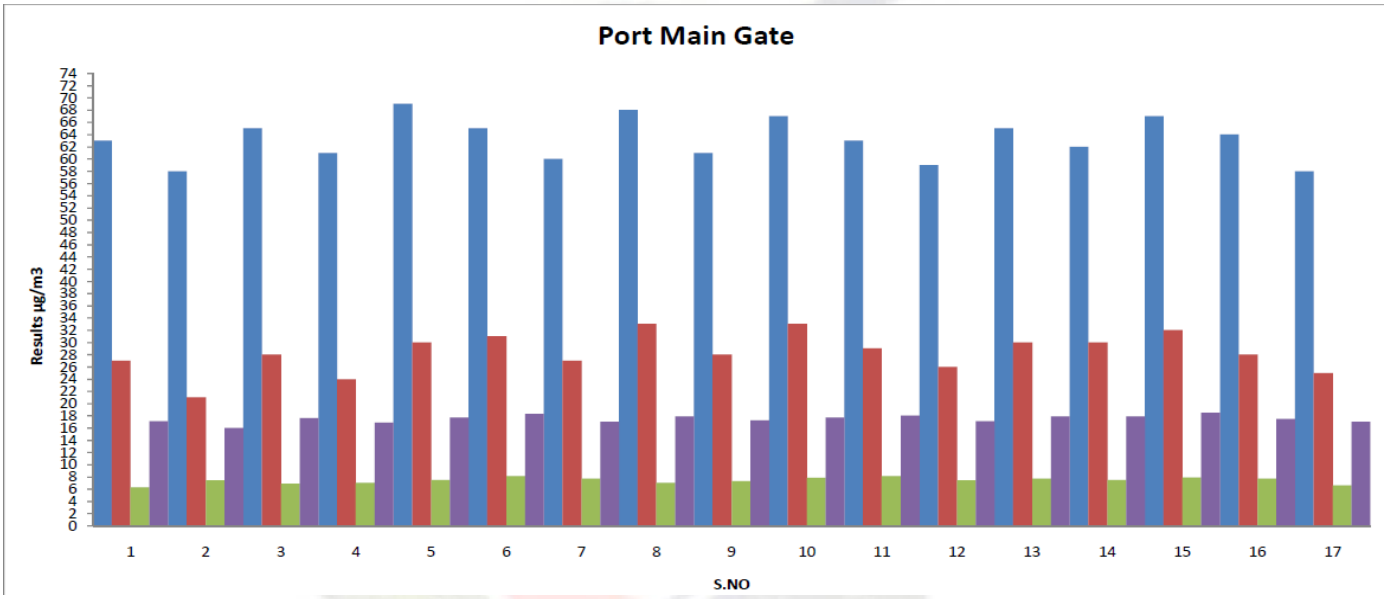
Results and Discussion

The results of the ambient air quality for the study period are submitted. 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"

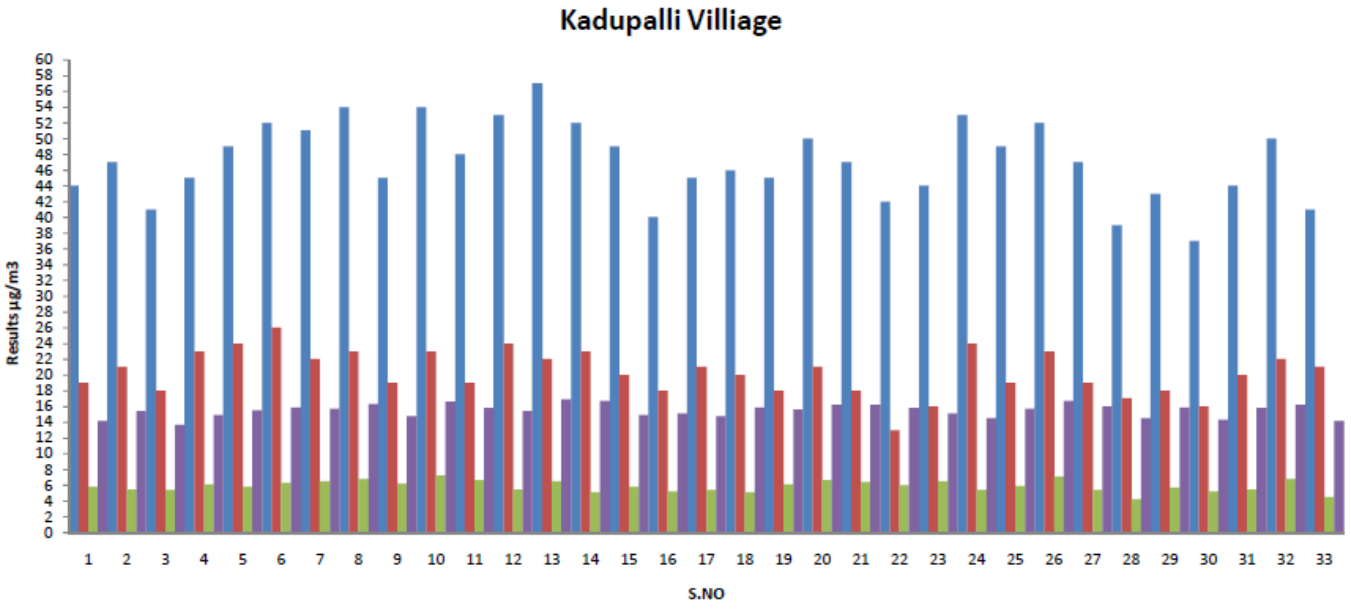
MARINE CONTROL (AAQ1)													
Parameters			Particular matter PM_{10}	Particular matter $PM_{2.5}$	Sulphur dioxide as SO_2	Nitrogen dioxide as NO_2	Lead as Pb	Carbon monoxide as CO	Ozone as O_3	Ammonia as NH_3	Arsenic as As	Nickel as Ni	Benzene as C_6H_6	Benzo (a) pyrene as BaP
Unit			µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	mg/m^3	µg/m^3	µg/m^3	ng/m^3	ng/m^3	µg/m^3	ng/m^3
National AAQM Standard			100	60	80	80	1	4	180	400	6	20	5	1
S.No.	Sampling Date	Report Number												
1	18.05.2020	GCS/LAB/S/2536/20-21	57	24	6.8	16.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
2	22.05.2020	GCS/LAB/S/2536/20-21	60	26	7.1	17.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
3	08.06.2020	GCS/LAB/S/2584/20-21	64	27	7.5	17.3	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
4	12.06.2020	GCS/LAB/S/2584/20-21	55	23	7.7	18.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
5	06.07.2020	GCS/LAB/S/2641/20-21	57	25	6.9	16.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
6	10.07.2020	GCS/LAB/S/2641/20-21	59	28	7.1	17.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
7	15.07.2020	GCS/LAB/S/2641/20-21	54	22	6.5	17.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
8	17.07.2020	GCS/LAB/S/2641/20-21	61	30	7.9	17.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
9	10.08.2020	GCS/LAB/S/2837/20-21	50	24	6.6	15.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
10	13.08.2020	GCS/LAB/S/2837/20-21	57	26	7.3	17.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
11	24.08.2020	GCS/LAB/S/2837/20-21	49	19	6.1	17.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
12	28.08.2020	GCS/LAB/S/2837/20-21	58	29	7.5	16.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
13	07.09.2020	GCS/LAB/S/2911/20-21	58	27	6.9	17.3	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
14	11.09.2020	GCS/LAB/S/2911/20-21	63	29	7.7	17.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
15	21.09.2020	GCS/LAB/S/2911/20-21	55	23	6.5	16.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
16	28.09.2020	GCS/LAB/S/2911/20-21	51	20	7.1	16.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1



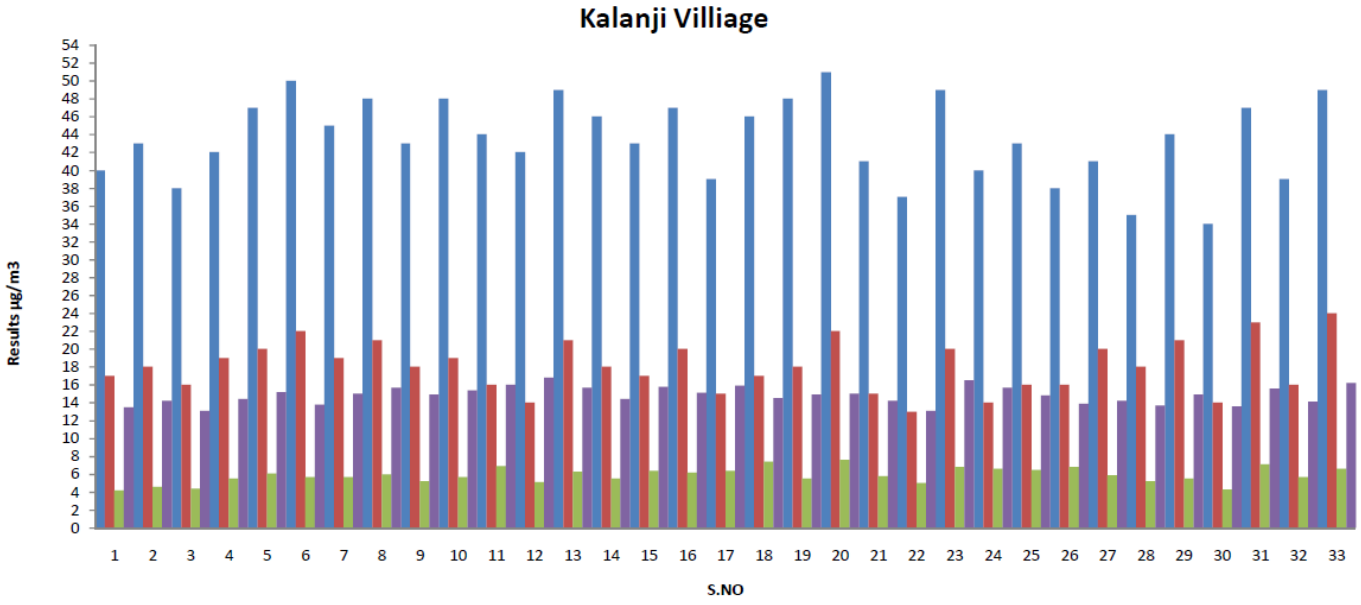
PORT MAIN GATE (AAQ2)													
Parameters			Particular matter PM_{10}	Particular matter $PM_{2.5}$	Sulphur dioxide as SO_2	Nitrogen dioxide as NO_2	Lead as Pb	Carbon monoxide as CO	Ozone as O_3	Ammonia as NH_3	Arsenic as As	Nickel as Ni	Benzene as C_6H_6	Benzo (a) pyrene as BaP
Unit			$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	mg/m^3	$\mu g/m^3$	$\mu g/m^3$	ng/m^3	ng/m^3	$\mu g/m^3$	ng/m^3
National AAQM Standard			100	60	80	80	1	4	180	400	6	20	5	1
S.No.	Sampling Date	Report Number												
1	11.05.2020	GCS/LAB/S/2536/20-21	63	27	6.3	17.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
2	15.05.2020	GCS/LAB/S/2536/20-21	58	21	7.4	16.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
3	25.05.2020	GCS/LAB/S/2536/20-21	65	28	6.9	17.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
4	29.05.2020	GCS/LAB/S/2536/20-21	61	24	7.0	16.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
5	15.06.2020	GCS/LAB/S/2584/20-21	69	30	7.5	17.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
6	13.07.2020	GCS/LAB/S/2641/20-21	65	31	8.1	18.3	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
7	15.07.2020	GCS/LAB/S/2641/20-21	60	27	7.7	17.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
8	20.07.2020	GCS/LAB/S/2641/20-21	68	33	7.0	17.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
9	24.07.2020	GCS/LAB/S/2641/20-21	61	28	7.3	17.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
10	03.08.2020	GCS/LAB/S/2837/20-21	67	33	7.8	17.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
11	07.08.2020	GCS/LAB/S/2837/20-21	63	29	8.1	18.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
12	17.08.2020	GCS/LAB/S/2837/20-21	59	26	7.4	17.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
13	20.08.2020	GCS/LAB/S/2837/20-21	65	30	7.7	17.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
14	01.09.2020	GCS/LAB/S/2911/20-21	62	30	7.5	17.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
15	04.09.2020	GCS/LAB/S/2911/20-21	67	32	7.9	18.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
16	14.09.2020	GCS/LAB/S/2911/20-21	64	28	7.7	17.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
17	17.09.2020	GCS/LAB/S/2911/20-21	58	25	6.6	17.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1



KATTUPALLI VILLAGE (AAQ3)													
Parameters			Particular matter PM_{10}	Particular matter $PM_{2.5}$	Sulphur dioxide as SO_2	Nitrogen dioxide as NO_2	Lead as Pb	Carbon monoxide as CO	Ozone as O_3	Ammonia as NH_3	Arsenic as As	Nickel as Ni	Benzene as C_6H_6	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 Date	Report Number												
1	11.05.2020	GCS/LAB/S/2536/20-21	44	19	5.8	14.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
2	15.05.2020	GCS/LAB/S/2536/20-21	47	21	5.5	15.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
3	18.05.2020	GCS/LAB/S/2536/20-21	41	18	5.4	13.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
4	22.05.2020	GCS/LAB/S/2536/20-21	45	23	6.1	14.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
5	25.05.2020	GCS/LAB/S/2536/20-21	49	24	5.8	15.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
6	29.05.2020	GCS/LAB/S/2536/20-21	52	26	6.3	15.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
7	08.06.2020	GCS/LAB/S/2584/20-21	51	22	6.5	15.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
8	12.06.2020	GCS/LAB/S/2584/20-21	54	23	6.8	16.3	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
9	15.06.2020	GCS/LAB/S/2584/20-21	45	19	6.2	14.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
10	06.07.2020	GCS/LAB/S/2641/20-21	54	23	7.2	16.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
11	10.07.2020	GCS/LAB/S/2641/20-21	48	19	6.6	15.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
12	13.07.2020	GCS/LAB/S/2641/20-21	53	24	5.5	15.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
13	15.07.2020	GCS/LAB/S/2641/20-21	57	22	6.5	16.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
14	17.07.2020	GCS/LAB/S/2641/20-21	52	23	5.1	16.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
15	20.07.2020	GCS/LAB/S/2641/20-21	49	20	5.8	14.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
16	24.07.2020	GCS/LAB/S/2641/20-21	40	18	5.2	15.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
17	27.07.2020	GCS/LAB/S/2641/20-21	45	21	5.4	14.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
18	03.08.2020	GCS/LAB/S/2837/20-21	46	20	5.1	15.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
19	07.08.2020	GCS/LAB/S/2837/20-21	45	18	6.1	15.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
20	10.08.2020	GCS/LAB/S/2837/20-21	50	21	6.6	16.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
21	13.08.2020	GCS/LAB/S/2837/20-21	47	18	6.4	16.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
22	17.08.2020	GCS/LAB/S/2837/20-21	42	13	6.0	15.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
23	20.08.2020	GCS/LAB/S/2837/20-21	44	16	6.5	15.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
24	24.08.2020	GCS/LAB/S/2837/20-21	53	24	5.4	14.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
25	28.08.2020	GCS/LAB/S/2837/20-21	49	19	5.9	15.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
26	01.09.2020	GCS/LAB/S/2911/20-21	52	23	7.1	16.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
27	04.09.2020	GCS/LAB/S/2911/20-21	47	19	5.4	16.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
28	07.09.2020	GCS/LAB/S/2911/20-21	39	17	4.2	14.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
29	11.09.2020	GCS/LAB/S/2911/20-21	43	18	5.7	15.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
30	14.09.2020	GCS/LAB/S/2911/20-21	37	16	5.2	14.3	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
31	17.09.2020	GCS/LAB/S/2911/20-21	44	20	5.5	15.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
32	21.09.2020	GCS/LAB/S/2911/20-21	50	22	6.8	16.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
33	28.09.2020	GCS/LAB/S/2911/20-21	41	21	4.5	14.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1



KALANJI VILLAGE (AAQ4)													
Parameters			Particular matter PM_{10}	Particular matter $PM_{2.5}$	Sulphur dioxide as SO_2	Nitrogen dioxide as NO_2	Lead as Pb	Carbon monoxide as CO	Ozone as O_3	Ammonia as NH_3	Arsenic as As	Nickel as Ni	Benzene as C_6H_6	Benzo (a) pyrene as BaP
Unit			$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	mg/m^3	$\mu g/m^3$	$\mu g/m^3$	ng/m^3	ng/m^3	$\mu g/m^3$	ng/m^3
National AAQM Standard			100	60	80	80	1	4	180	400	6	20	5	1
S.No.	Sampling Date	Report Number												
1	11.05.2020	GCS/LAB/S/2536/20-21	40	17	4.2	13.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
2	15.05.2020	GCS/LAB/S/2536/20-21	43	18	4.6	14.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
3	18.05.2020	GCS/LAB/S/2536/20-21	38	16	4.4	13.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
4	22.05.2020	GCS/LAB/S/2536/20-21	42	19	5.5	14.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
5	25.05.2020	GCS/LAB/S/2536/20-21	47	20	6.1	15.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
6	29.05.2020	GCS/LAB/S/2536/20-21	50	22	5.7	13.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
7	08.06.2020	GCS/LAB/S/2584/20-21	45	19	5.7	15.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
8	12.06.2020	GCS/LAB/S/2584/20-21	48	21	6.0	15.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
9	15.06.2020	GCS/LAB/S/2584/20-21	43	18	5.2	14.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
10	06.07.2020	GCS/LAB/S/2641/20-21	48	19	5.7	15.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
11	10.07.2020	GCS/LAB/S/2641/20-21	44	16	6.9	16.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
12	13.07.2020	GCS/LAB/S/2641/20-21	42	14	5.1	16.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
13	15.07.2020	GCS/LAB/S/2641/20-21	49	21	6.3	15.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
14	17.07.2020	GCS/LAB/S/2641/20-21	46	18	5.5	14.4	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
15	20.07.2020	GCS/LAB/S/2641/20-21	43	17	6.4	15.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
16	24.07.2020	GCS/LAB/S/2641/20-21	47	20	6.2	15.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
17	27.07.2020	GCS/LAB/S/2641/20-21	39	15	6.4	15.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
18	03.08.2020	GCS/LAB/S/2837/20-21	46	17	7.4	14.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
19	07.08.2020	GCS/LAB/S/2837/20-21	48	18	5.5	14.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
20	10.08.2020	GCS/LAB/S/2837/20-21	51	22	7.6	15.0	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
21	13.08.2020	GCS/LAB/S/2837/20-21	41	15	5.8	14.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
22	17.08.2020	GCS/LAB/S/2837/20-21	37	13	5.0	13.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
23	20.08.2020	GCS/LAB/S/2837/20-21	49	20	6.8	16.5	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
24	24.08.2020	GCS/LAB/S/2837/20-21	40	14	6.6	15.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
25	28.08.2020	GCS/LAB/S/2837/20-21	43	16	6.5	14.8	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
26	01.09.2020	GCS/LAB/S/2911/20-21	38	16	6.8	13.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
27	04.09.2020	GCS/LAB/S/2911/20-21	41	20	5.9	14.2	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
28	07.09.2020	GCS/LAB/S/2911/20-21	35	18	5.2	13.7	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
29	11.09.2020	GCS/LAB/S/2911/20-21	44	21	5.5	14.9	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
30	14.09.2020	GCS/LAB/S/2911/20-21	34	14	4.3	13.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
31	17.09.2020	GCS/LAB/S/2911/20-21	47	23	7.1	15.6	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
32	21.09.2020	GCS/LAB/S/2911/20-21	39	16	5.7	14.1	<0.1	<1.0	<10	<2	<2	<2	<1	<0.1
33	28.09.2020	GCS/LAB/S/2911/20-21	49	24	6.6	16.2	<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 precalibrated Noise Level Meter – SL- 4023 SD for day and night periods.

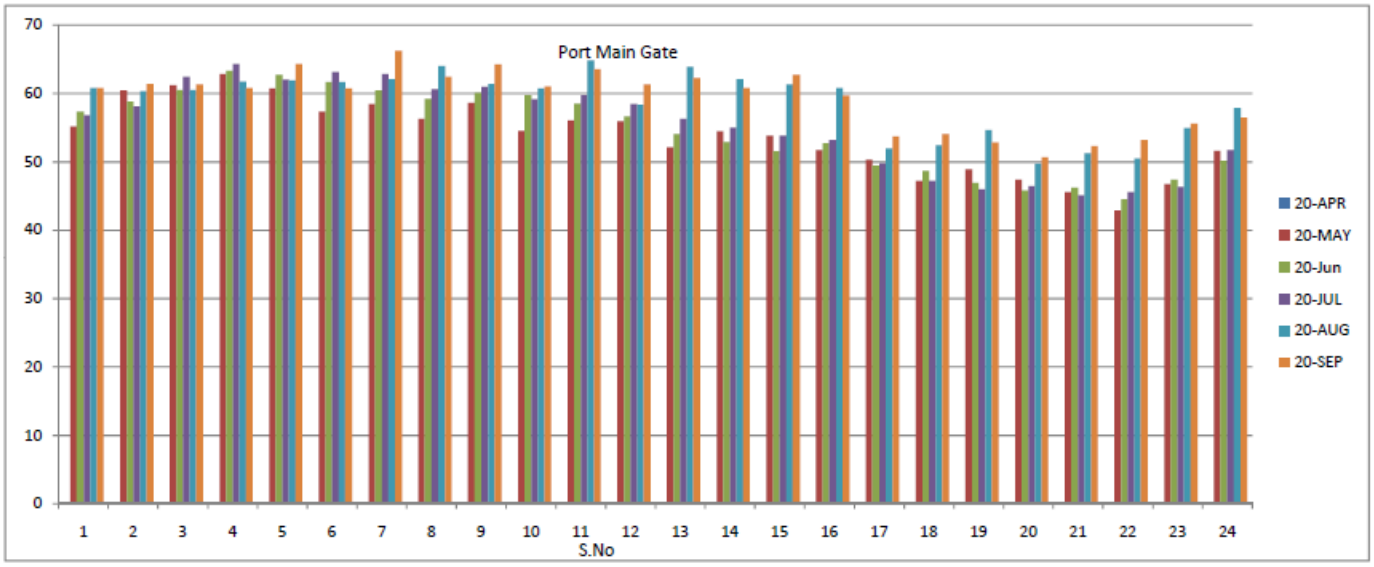
DETAILS OF NOISE MONITORING LOCATIONS

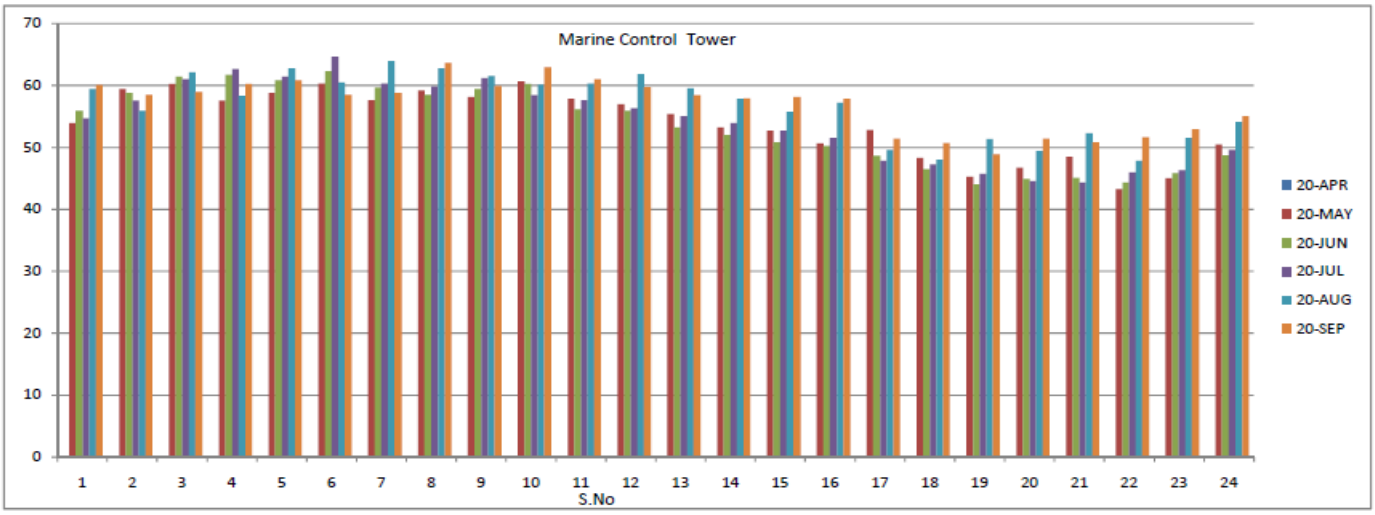
STATION CODE	LOCATIONS	Geographical Location
N1	Port main gate	N 13^0 18.856' E 080^0 19.478'
N2	Marine control tower	N 13^0 18.909' E 080^0 20.756'
N3	Kattupalli village	N 13^0 18.342' E 080^0 19.806'
N4	Kalanji village	N 13^0 20.156' E 080^0 20.023'

Fig – 4. Noise Level Sampling Locations

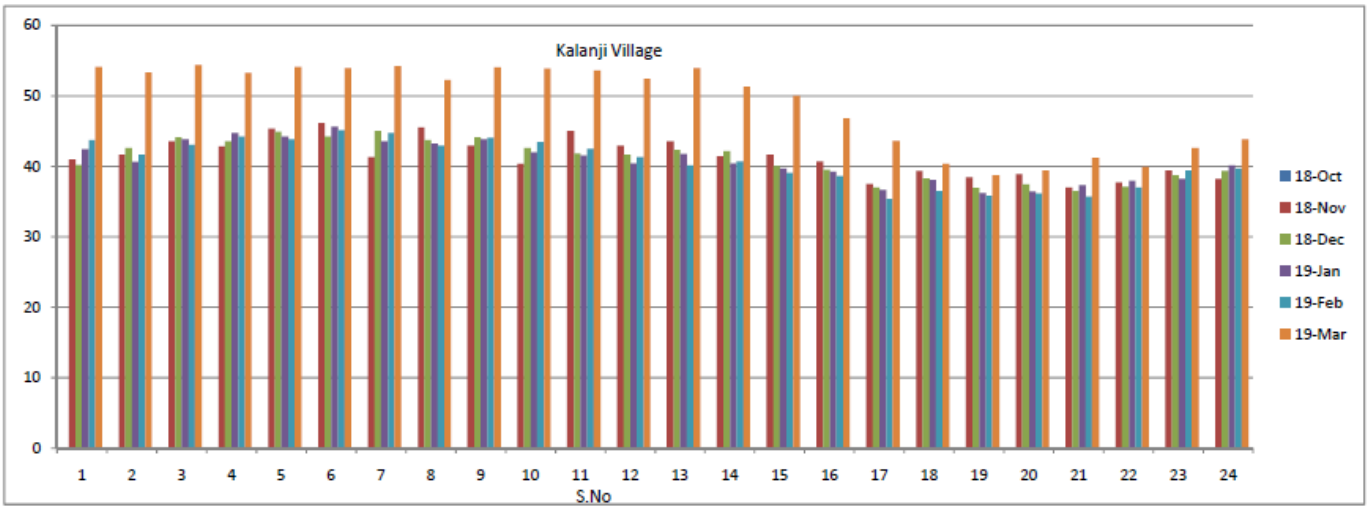
The noise levels monitored during the study period are given hereunder in form of Leq day, Leq night compared with CPCB Standards.

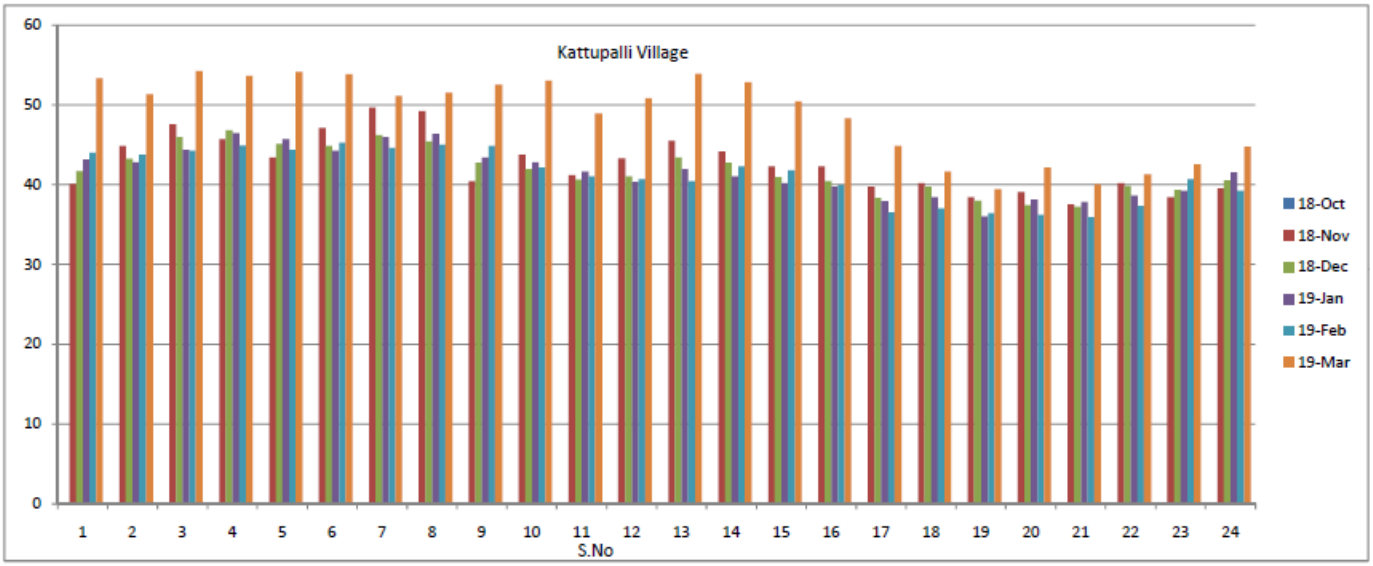
Location		PORT MAIN GATE						MARINE CONTROL					
Month & Year		Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
Parameter & Unit		Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)
S.No.	Time of Sampling												
1	06.00 – 07.00 (Day)	--	55.1	57.3	56.8	60.8	60.8	--	53.9	55.9	54.7	59.4	60
2	07.00 –08.00	--	60.4	58.8	58.1	60.3	61.4	--	59.4	58.7	57.5	55.9	58.5
3	08.00 – 09.00	--	61.2	60.5	62.4	60.5	61.3	--	60.2	61.4	61	62.1	58.9
4	09.00 – 10.00	--	62.8	63.3	64.3	61.7	60.8	--	57.5	61.7	62.6	58.3	60.2
5	10.00 – 11.00	--	60.7	62.7	62	61.9	64.3	--	58.7	60.8	61.4	62.7	60.8
6	11.00 – 12.00	--	57.3	61.6	63.1	61.6	60.7	--	60.3	62.3	64.6	60.5	58.5
7	12.00 – 13.00	--	58.4	60.4	62.8	62.1	66.2	--	57.6	59.6	60.3	63.9	58.7
8	13.00 – 14.00	--	56.3	59.2	60.6	64	62.4	--	59.2	58.5	59.8	62.7	63.6
9	14.00 – 15.00	--	58.6	60.1	60.9	61.4	64.2	--	58.1	59.4	61.2	61.5	59.9
10	15.00 – 16.00	--	54.5	59.7	59.1	60.7	61	--	60.6	60.2	58.4	60.1	62.9
11	16.00 – 17.00	--	56	58.5	59.7	64.8	63.5	--	57.8	56.1	57.6	60.3	61
12	17.00 – 18.00	--	55.9	56.6	58.4	58.3	61.3	--	56.9	55.9	56.3	61.8	59.7
13	18.00 – 19.00	--	52.1	54	56.3	63.9	62.2	--	55.4	53.2	55	59.5	58.4
14	19.00 –20.00	--	54.4	52.9	55	62.1	60.8	--	53.2	52	53.9	57.8	57.9
15	20.00 – 21.00	--	53.8	51.5	53.8	61.3	62.7	--	52.7	50.8	52.7	55.7	58.1
16	21.00 – 22.00	--	51.7	52.7	53.1	60.8	59.6	--	50.6	50.2	51.5	57.2	57.8
17	22.00 – 23.00 (Night)	--	50.3	49.4	49.8	51.9	53.7	--	52.8	48.6	47.8	49.6	51.4
18	23.00 – 00.00	--	47.2	48.6	47.2	52.4	54	--	48.3	46.4	47.2	48	50.7
19	00.00 – 01.00	--	48.9	46.9	46	54.6	52.8	--	45.2	44	45.7	51.3	48.9
20	01.00 – 02.00	--	47.3	45.8	46.4	49.7	50.6	--	46.7	44.9	44.5	49.4	51.4
21	02.00 – 03.00	--	45.5	46.2	45.1	51.2	52.3	--	48.4	45.1	44.3	52.2	50.8
22	03.00 – 04.00	--	42.8	44.5	45.5	50.5	53.1	--	43.2	44.3	45.9	47.8	51.6
23	04.00 – 05.00	--	46.7	47.3	46.3	54.9	55.6	--	45	45.8	46.3	51.5	52.9
24	05.00 – 06.00	--	51.6	50.1	51.7	57.8	56.4	--	50.4	48.7	49.6	54.1	55





Location		KATTUPALLI VILLAGE						KALANJI VILLAGE					
Month & Year		Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
Parameter & Unit		Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)
S.No.	Time of Sampling												
1	06.00 – 07.00 (Day)	--	40.1	41.7	43.1	44	53.3	--	40.9	40.2	42.4	43.7	54.1
2	07.00 –08.00	--	44.8	43.2	42.8	43.7	51.3	--	41.6	42.6	40.6	41.6	53.3
3	08.00 – 09.00	--	47.5	45.9	44.3	44.2	54.2	--	43.5	44.1	43.8	43	54.4
4	09.00 – 10.00	--	45.7	46.8	46.4	44.9	53.6	--	42.8	43.5	44.7	44.2	53.2
5	10.00 – 11.00	--	43.4	45.1	45.7	44.3	54.1	--	45.3	44.9	44.2	43.8	54.1
6	11.00 – 12.00	--	47.1	44.8	44.2	45.2	53.8	--	46.1	44.2	45.6	45.1	53.9
7	12.00 – 13.00	--	49.6	46.2	45.9	44.6	51.1	--	41.3	45	43.5	44.7	54.2
8	13.00 – 14.00	--	49.2	45.4	46.3	45	51.5	--	45.5	43.7	43.2	42.9	52.2
9	14.00 – 15.00	--	40.4	42.7	43.4	44.8	52.5	--	42.9	44.1	43.8	44	54
10	15.00 – 16.00	--	43.7	41.9	42.8	42.1	53	--	40.3	42.6	42	43.4	53.8
11	16.00 – 17.00	--	41.2	40.6	41.6	41	48.9	--	45	41.8	41.5	42.5	53.6
12	17.00 – 18.00	--	43.3	41	40.3	40.7	50.8	--	42.9	41.6	40.4	41.3	52.4
13	18.00 – 19.00	--	45.5	43.4	41.9	40.4	53.9	--	43.5	42.3	41.7	40.1	53.9
14	19.00 –20.00	--	44.1	42.7	41	42.3	52.8	--	41.4	42.1	40.4	40.7	51.3
15	20.00 – 21.00	--	42.3	40.9	40.2	41.8	50.4	--	41.6	40	39.6	39	50
16	21.00 – 22.00	--	42.3	40.4	39.7	39.9	48.3	--	40.7	39.5	39.2	38.6	46.8
17	22.00 – 23.00 (Night)	--	39.7	38.3	37.9	36.5	44.8	--	37.5	37	36.6	35.3	43.6
18	23.00 – 00.00	--	40.2	39.7	38.4	37	41.6	--	39.3	38.3	38	36.5	40.3
19	00.00 – 01.00	--	38.4	38	36	36.4	39.4	--	38.4	36.9	36.2	35.8	38.7
20	01.00 – 02.00	--	39.1	37.4	38.1	36.2	42.1	--	38.9	37.4	36.4	36.1	39.4
21	02.00 – 03.00	--	37.5	37.2	37.8	35.9	40	--	37	36.5	37.3	35.7	41.2
22	03.00 – 04.00	--	40.2	39.8	38.6	37.3	41.3	--	37.7	37.1	37.9	37	39.9
23	04.00 – 05.00	--	38.4	39.3	39.2	40.7	42.5	--	39.4	38.7	38.2	39.4	42.6
24	05.00 – 06.00	--	39.5	40.5	41.5	39.2	44.7	--	38.2	39.3	40.1	39.6	43.8





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.

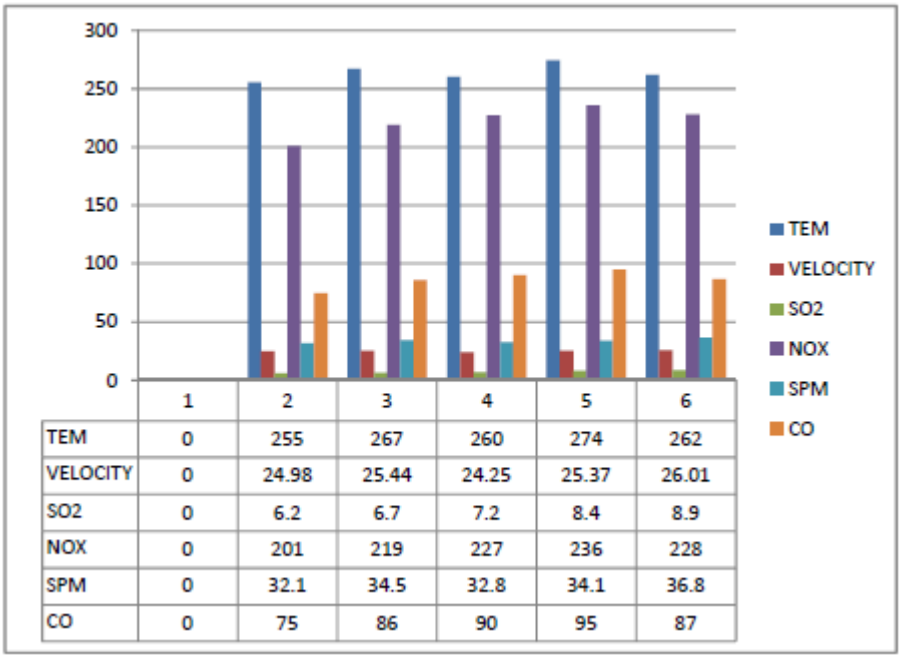
iv. DG SET EMISSIONS

Sampling of Flue gas emission of 2000 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

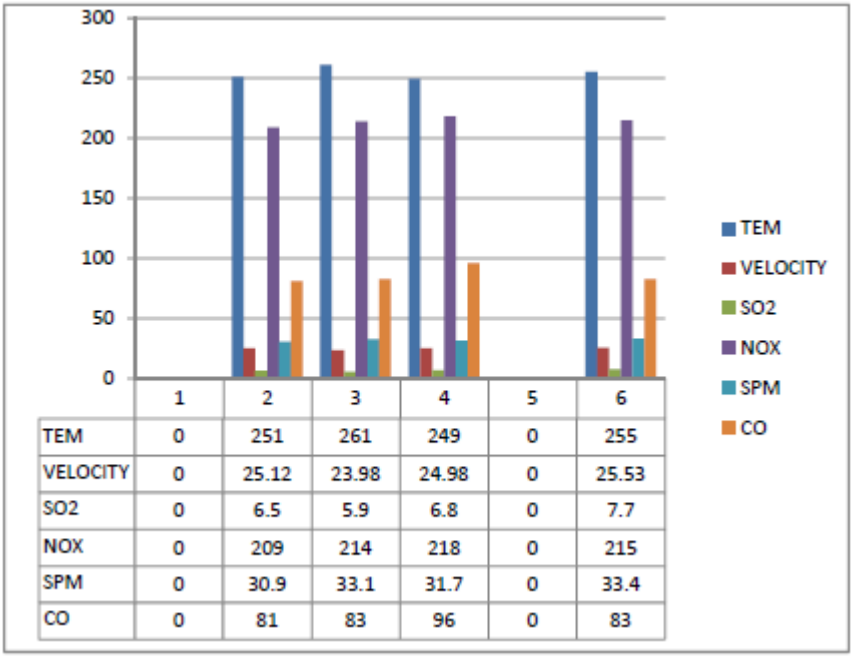
DETAILS OF EMISSION MONITORING LOCATIONS

STATION CODE	LOCATIONS	Geographical Location
SM – 1	DG – 1 2000 KVA	13^0 19'6" N 80^0 19' 34" E
SM – 2	DG – 2 2000 KVA	

STACK MONITORING													
Location		DG 2000KVA - 1						DG 2000KVA - 2					
Month & Year		Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
S.No.	Parameters												
1	Stack Temperature, °C	--	255	267	260	274	262	--	251	261	249	--	255
2	Flue Gas Velocity, m/s	--	24.98	25.44	24.25	25.37	26.01	--	25.12	23.98	24.98	--	25.53
3	Sulphur Dioxide, mg/Nm3	--	6.2	6.7	7.2	8.4	8.9	--	6.5	5.9	6.8	--	7.7
4	NOX (as NO2) in ppmv	--	201	219	227	236	228	--	209	214	218	--	215
5	Particular matter, mg/Nm3	--	32.1	34.5	32.8	34.1	36.8	--	30.9	33.1	31.7	--	33.4
6	Carbon Monoxide, mg/Nm3	--	75	86	90	95	87	--	81	83	96	--	83
7	Gas Discharge, Nm3/hr	--	6337	6311	6127	6213	6512	--	6420	6015	6445	--	6478



	1	2	3	4	5	6
TEM	0	255	267	260	274	262
VELOCITY	0	24.98	25.44	24.25	25.37	26.01
SO2	0	6.2	6.7	7.2	8.4	8.9
NOX	0	201	219	227	236	228
SPM	0	32.1	34.5	32.8	34.1	36.8
CO	0	75	86	90	95	87



	1	2	3	4	5	6
TEM	0	251	261	249	0	255
VELOCITY	0	25.12	23.98	24.98	0	25.53
SO2	0	6.5	5.9	6.8	0	7.7
NOX	0	209	214	218	0	215
SPM	0	30.9	33.1	31.7	0	33.4
CO	0	81	83	96	0	83

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.

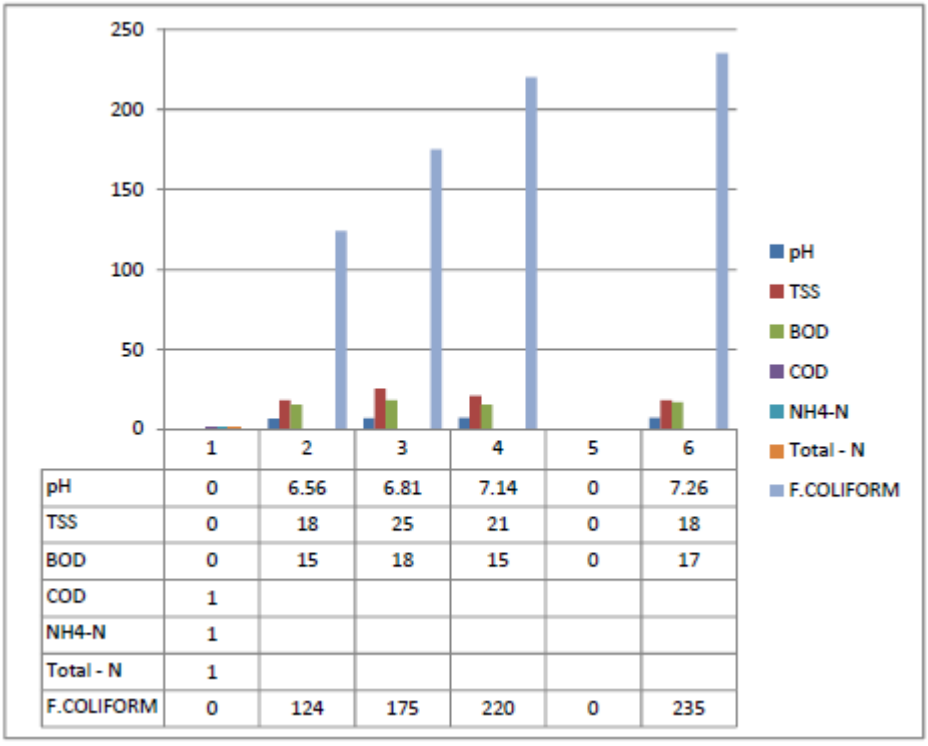
- 30 KLD Treated Water Outlet
- 5 KLD Treated Water Outlet

DETAILS OF STP WATER LOCATIONS

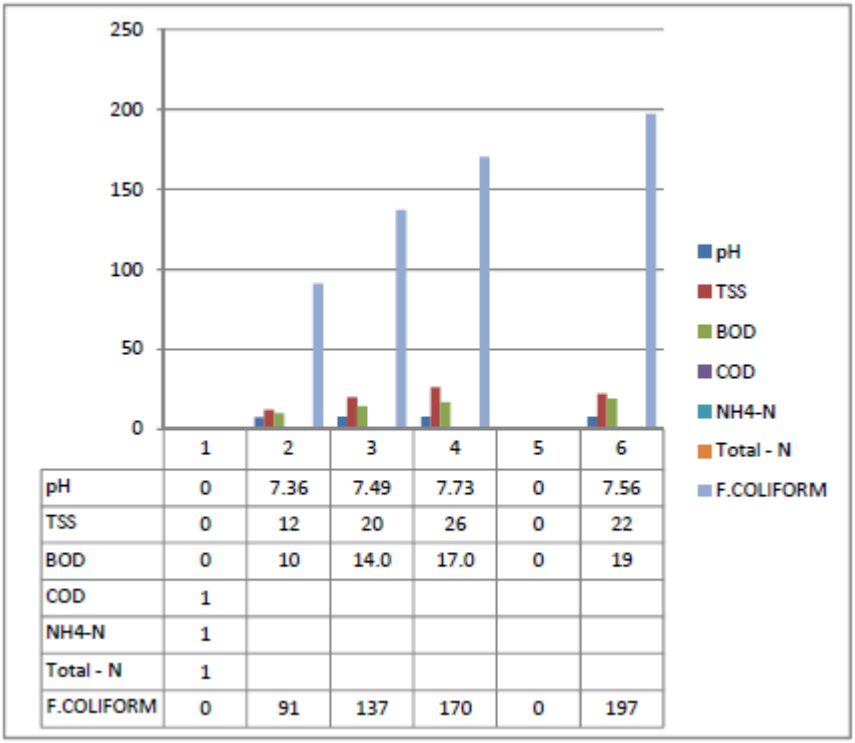
STATION CODE	LOCATIONS	Geographical Location
STP – 1	30 KLD	13^0 18'36" N 80^0 20' 25" E
STP – 2	5 KLD	13^0 19'6" N 80^0 19' 35" E

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

STP OUTLET WATER													
Location		STP 30KLD OUTLET						STP 5KLD OUTLET					
Month & Year		Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
S.No.	Parameters												
1	pH @ 25°C	--	6.56	6.81	7.14	--	7.26	--	7.36	7.49	7.73	--	7.56
2	Total Suspended Solids, mg/L	--	18	25	21	--	18	--	12	20	26	--	22
3	BOD at 27°C for 3 days, mg/L	--	15	18	15	--	17	--	10	14.0	17.0	--	19
4	Fecal Coliform, MPN/100ml	--	124	175	220	--	235	--	91	137	170	--	197



	1	2	3	4	5	6
pH	0	6.56	6.81	7.14	0	7.26
TSS	0	18	25	21	0	18
BOD	0	15	18	15	0	17
COD	1					
NH4-N	1					
Total - N	1					
F.COLIFORM	0	124	175	220	0	235



	1	2	3	4	5	6
pH	0	7.36	7.49	7.73	0	7.56
TSS	0	12	20	26	0	22
BOD	0	10	14.0	17.0	0	19
COD	1					
NH4-N	1					
Total - N	1					
F.COLIFORM	0	91	137	170	0	197

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 13th October, 2017

G.S.R. 1265(E).—In exercise of the powers conferred by sections 6 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby makes the following rules further to amend the Environment (Protection) Rules, 1986, namely:-

1. **Short title and commencement.**—(1) These rules may be called the Environment (Protection) Amendment Rules, 2017.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. In the Environment (Protection) Rules, 1986, in Schedule – I, after serial number 104 and the entries relating thereto, the following serial number and entries shall be inserted, namely:—

Sl. No.	Industry	Parameters	Standards	
1	2	3	4	
		Effluent discharge standards (applicable to all mode of disposal)		
"105	Sewage Treatment Plants (STPs)		Location	Concentration not to exceed
			(a)	(b)
		pH	Anywhere in the country	6.5-9.0
		Bio-Chemical Oxygen Demand (BOD)	Metro Cities*, all State Capitals except in the State of Arunachal Pradesh, Assam, Manipur, Meghalaya Mizoram, Nagaland, Tripura Sikkim, Himachal Pradesh, Uttarakhand, Jammu and Kashmir, and Union territory of Andaman and Nicobar Islands, Dadar and Nagar Haveli Daman and Diu and Lakshadweep	20
			Areas/regions other than mentioned above	30
		Total Suspended Solids (TSS)	Metro Cities*, all State Capitals except in the State of Arunachal Pradesh, Assam, Manipur, Meghalaya Mizoram, Nagaland, Tripura Sikkim, Himachal Pradesh, Uttarakhand, Jammu and Kashmir and Union territory of Andaman and Nicobar Islands, Dadar and Nagar Haveli Daman and Diu and Lakshadweep	<50
			Areas/regions other than mentioned above	<100
		Fecal Coliform (FC) (Most Probable Number per 100 milliliter, MPN/100ml	Anywhere in the country	<1000
*Metro Cities are Mumbai, Delhi, Kolkata, Chennai, Bengaluru, Hyderabad, Ahmedabad and Pune.				

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.

DRINKING WATER								
Month & Year		Unit	Apr-20	May-20	Jun-20	Jul-20*	Aug-20	Sep-20
S.No.	Parameters							
1	pH @ 25°C	-		7.56	7.19	8.19	8.08	7.14
2	Total Hardness as CaCo3	mg/L	--	BDL (DL:1.0)	5.0	358	BDL (DL:1.0)	12
3	Chloride as Cl	mg/L	--	14	17	410	7.5	21
4	Total Dissolved Solids	mg/L	--	28	35	1124	22	38
5	Calcium as Ca	mg/L	--	BDL (DL:0.4)	1.2	91	BDL (DL:0.4)	1.6
6	Sulphate as SO4	mg/L	--	1.5	2.7	147	1.05	3.2
7	Nitrate as No3	mg/L		BDL (DL:1.0)		2.58	BDL (DL:1.0)	
8	Total Alkalinity as $CaCo_3$	mg/L	--	17	22	323	13	9
9	Magnesium as Mg	mg/L	--	BDL (DL:0.24)	0.48	31	BDL (DL:0.24)	1.92
10	Color	Hazen	--	<1.0	<1.0	5	<1.0	<1.0
11	Odour	-	--	Unobjectionable				
12	Taste	-	--	Agreeable				
13	Turbidity	NTU	--	<0.5	<0.5	1.1	<0.5	<0.6
14	Iron as Fe	mg/L	--	BDL(DL 0.05)				
15	Total Residual Chlorine	mg/L	--	BDL(DL 0.1)				
16	Copper as Cu	mg/L	--	BDL(DL 0.05)				
17	Manganese as Mn	mg/L	--	BDL(DL 0.05)				
18	Fluoride as F	mg/L	--	BDL(DL 0.1)		0.27	BDL(DL 0.1)	
19	Phenolic compounds as C_6H_5OH	mg/L	--	BDL(DL 0.001)				
20	Mercury as Hg	mg/L	--	BDL(DL 0.001)				
21	Cadmium as Cd	mg/L	--	BDL(DL 0.003)				
22	Selenium as Se	mg/L	--	BDL(DL 0.01)				
23	Arsenic as As	mg/L	--	BDL(DL 0.01)				
24	Lead as Pb	mg/L	--	BDL(DL 0.01)				
25	Zinc as Zn	mg/L	--	BDL(DL 0.05)				
26	Anionic Detergents as MBAS	mg/L	--	Nil				
27	Total Chromium as Cr	mg/L	--	BDL(DL 0.05)				
28	Phenolphthalein Alkalinity as $CaCo_3$	mg/L	--	Nil				
29	Aluminium as Al	mg/L	--	BDL(DL 0.05)				
30	Boron as B	mg/L	--	BDL(DL 0.1)				
31	Mineral Oil	mg/L	--	Nil				
32	Polynuclear Aromatic Hydrocarbons as [PAH]	mg/L	--	Nil				
33	Pesticides	mg/L	--	Nil				
34	Cyanide as CN	mg/L	--	BDL (DL : 0.01)				
35	E. coli	MPN/100ml	--	Absence				
36	Total Coliform	MPN/100ml	--	Absence				

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	CB – 1	13^0 18’50” N 80^0 20’ 51” E
MW – 2 / MS – 2	CB – 2	13^0 18’46” N 80^0 20’ 49” E
MW – 3 / MS – 3	BERTH – 3	13^0 18’41” N 80^0 21’ 4” E

Fig – 5. Water and Marine Sampling Locations

MARINE WATER													
Location			CB - 1 Surface Water					CB - 2 Surface Water					
Month & Year		Unit	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
S.No.	Parameters													
1	pH @ 25°C	-	--	8.36	868	7.96	8.1	7.98	--	8.12	8.45	7.84	8.13	7.56
2	Temperature	°C	--	29	29	29	29	29	--	29	29	29	29	29
3	Total Suspended Solids	mg/L	--	24	18	21	27	29	--	22	20	24	26	30
4	BOD at 27 °C for 3 days	mg/L	--	28	24	26	20	19	--	25	27	23	21	22
5	Dissolved oxygen	mg/L	--	3.7	3.6	3.5	3.6	3.4	--	3.8	3.4	3.2	3.4	3.2
6	Salinity at 25 °C	-	--	41.3	42.5	42.1	40.8	42.8	--	42	42.8	41.7	41	42.1
7	Oil & Grease	mg/L	--	BDL(DL 1.0)					--	BDL(DL 1.0)				
8	Nitrate as No_3	mg/L	--	6.58	6.91	6.08	6.96	7.5	--	7.42	7.17	7.56	6.18	8.05
9	Nitrite as No_2	mg/L	--	5.75	5.14	4.28	3.79	4.86	--	6.14	5.86	5.35	4.41	5.12
10	Ammonical Nitrogen as N	mg/L	--	BDL(DL 1.0)					--	BDL(DL 1.0)				
11	Ammonia as NH3	mg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
12	Kjeldahl Nitrogen as N	mg/L	--	BDL(DL 1.0)					--	BDL(DL 1.0)				
13	Total phosphates as PO4	mg/L	--	5.82	6.53	6.94	5.14	5.72	--	5.93	6.87	6.02	6.47	5.27
14	Total Nitrogen	mg/L	--	BDL(DL 1.0)					--	BDL(DL 1.0)				
15	Total Dissolved Solids	mg/L	--	40987	42314	42814	40896	41563	--	41425	42786	41785	41028	41964
16	COD	mg/L	--	105	118	131	137	158	--	122	110	120	146	165
17	Total bacterial count	cfu/ml	--	62	69	80	90	105	--	74	71	60	80	96
18	Coliforms	Per 100 ml	--	Absence					--	Absence				
19	Escherichia coli	Per 100 ml	--	Absence					--	Absence				
20	Salmonella	Per 100 ml	--	Absence					--	Absence				
21	Shigella	Per 100 ml	--	Absence					--	Absence				
22	Vibrio cholerae	Per 100 ml	--	Absence					--	Absence				
23	Vibrio parahaemolyticus	Per 100 ml	--	Absence					--	Absence				
24	Enterococci	Per 100 ml	--	Absence					--	Absence				
25	Octane	µg/L	--	151	158	141	159	135	--	147	153	157	151	141
26	Nonane	µg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
27	Decane	µg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
28	Undecane	µg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
29	Tridecane	µg/L	--	6.8	8	8.9	8	6.8	--	6.1	7.6	8.2	8.8	7.6
30	Tetradecane	µg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
31	Pentadecane	µg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
32	Hexadecane	µg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
33	Octadecane	µg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
34	Nonadecane	µg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
35	Elcosane	µg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
36	Primary Productivity	mg C/m^3 /hr	--	7.95	9.86	8.82	8.97	9.42	--	8.72	9.25	9.47	8.17	8.61
37	Chlorophyll a	mg /m^3	--	3.18	5.24	4.18	4.9	5.03	--	4.56	5.98	4.56	3.94	4.32
38	Phaeophytin	mg /m^3	--	0.87	0.63	0.71	0.89	0.91	--	0.87	0.81	0.84	0.51	0.83
39	Oxidisable Paticular Organic	mg /L	--	4.24	6.18	5.01	6	5.06	--	5.01	6.56	5.58	4.83	4.94

						PHYTOPLANKTON								
40	Bacteriastrum hyalinum	nos/ml	--	18	15	12	13	21	--	10	12	15	19	14
41	Bacteriastrum varians	nos/ml	--	10	12	7	11	9	--	8	14	8	15	10
42	Chaetoceros didymus	nos/ml	--	15	14	10	6	17	--	14	10	11	3	8
43	Chaetoceros decipiens	nos/ml	--	7	9	8	9	13	--	12	8	13	5	12
44	Biddulphia mobiliensis	nos/ml	--	12	16	6	4	20	--	15	13	12	10	17
45	Ditylum brightwellii	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
46	Gyrosigma sp	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
47	Cladophyxis sps	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
48	Coscinodiscus centralis	nos/ml	--	16	13	6	12	14	--	17	15	9	8	9
49	Coscinodiscus granii	nos/ml	--	12	17	9	8	11	--	11	19	10	11	13
50	Cylcotella sps	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
51	Hemidiscus hardmanianus	nos/ml	--	16	10	3	7	9	--	18	21	7	6	11
52	Laudaria annulata	nos/ml	--	13	8	4	13	15	--	9	13	6	7	14
53	Pyropacus horologicum	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
54	Pleurosigma angulatum	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
55	Leptocylindrus danicus	nos/ml	--	15	11	14	3	6	--	16	18	15	2	5
56	Guinardia flaccida	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
57	Rhizosolenia alata	nos/ml	--	21	18	11	14	18	--	20	11	14	4	15
58	Rhizosolena impricata	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
59	Rhizosolena semispina	nos/ml	--	15	19	13	10	12	--	14	17	18	9	18
60	Thalassionema nitzschioides	nos/ml	--	9	16	12	18	21	--	8	13	12	12	20
61	Triceratium reticulatum	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
62	Ceratium trichoceros	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
63	Ceratium furca	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
64	Ceratium macroceros	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
65	Ceracium longipes	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
						ZOOPLANKTONS								
66	Acrocalanus gracilis	nos/ml	--	15	12	15	11	13	--	12	18	13	9	11
67	Acrocalanus sp	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
68	Paracalanus parvus	nos/ml	--	14	16	9	8	10	--	15	13	16	10	16
69	Eutintinus sps	nos/ml	--	7	10	8	12	9	--	11	8	14	7	10
70	Centropages furcatus	nos/ml	--	11	18	6	13	11	--	6	14	10	5	9
71	Corycaeus dana	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
72	Oithona brevicornis	nos/ml	--	15	9	12	14	16	--	10	17	11	12	15
73	Euterpina acutifrons	nos/ml	--	9	14	5	7	12	--	13	19	9	11	13
74	Metacalanus aurivilli	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
75	Copipod nauplii	nos/ml	--	17	19	10	9	7	--	14	10	15	17	14
76	Cirripede nauplii	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
77	Bivalve veliger	nos/ml	--	14	8	11	10	14	--	12	16	12	16	19
78	Gastropod veliger	nos/ml	--	20	15	13	15	17	--	9	13	11	8	18

Location			CB - 1 Bottom Water						CB - 2 Bottom Water					
Month & Year		Unit	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
S.No.	Parameters													
1	pH @ 25°C	-	--	7.56	8.03	7.98	7.92	7.98	--	7.93	8.17	8.01	8.04	7.76
2	Temperature	°C	--	29	29	29	29	29	--	29	29	29	29	29
3	Total Suspended Solids	mg/L	--	35	31	35	35	38	--	36	38	32	34	36
4	BOD at 27 °C for 3 days	mg/L	--	24	29	26	28	31	--	22	27	25	29	32
5	Dissolved oxygen	mg/L	--	3.1	3	3.1	3	3.2	--	3.3	2.9	3.2	2.8	3
6	Salinity at 25 °C	-	--	41.3	41.8	40.5	41.3	40	--	39.8	41.6	39.9	41.6	40.9
7	Oil & Grease	mg/L	--	BDL(DL 1.0)					--	BDL(DL 1.0)				
8	Nitrate as No_3	mg/L	--	7.42	7.86	7.15	7.74	7.86	--	6.83	7.32	6.44	7.03	7.47
9	Nitrite as No_2	mg/L	--	6.05	6.78	4.73	5.35	5.98	--	6.56	5.97	5.01	5.87	6.91
10	Ammonical Nitrogen as N	mg/L	--	BDL(DL 1.0)					--	BDL(DL 1.0)				
11	Ammonia as NH3	mg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
12	Kjeldahl Nitrogen as N	mg/L	--	BDL(DL 1.0)					--	BDL(DL 1.0)				
13	Total phosphates as PO4	mg/L	--	4.23	5.19	5.98	5.01	6.24	--	4.98	5.23	6.34	5.81	5.14
14	Total Nitrogen	mg/L	--	BDL(DL 1.0)					--	BDL(DL 1.0)				
15	Total Dissolved Solids	mg/L	--	41986	42981	41432	41896	40025	--	42543	43005	41529	42056	41158
16	COD	mg/L	--	127	138	145	130	147	--	132	144	148	141	159
17	Total bacterial count	cfu/ml	--	80	92	90	110	130	--	74	85	70	90	115
18	Coliforms	Per 100 ml	--	Absence					--	Absence				
19	Escherichia coli	Per 100 ml	--	Absence					--	Absence				
20	Salmonella	Per 100 ml	--	Absence					--	Absence				
21	Shigella	Per 100 ml	--	Absence					--	Absence				
22	Vibrio cholerae	Per 100 ml	--	Absence					--	Absence				
23	Vibrio parahaemolyticus	Per 100 ml	--	Absence					--	Absence				
24	Enterococci	Per 100 ml	--	Absence					--	Absence				
25	Colour	Hazan	--	20	25	30	35	30	--	30	25	35	40	25
26	Odour	-	--	Unobjectionable					--	Unobjectionable				
27	Taste	-	--	Disagreeable					--	Disagreeable				
28	Turbidity	NTU	--	37	44	49	41	44	--	32	47	42	45	41
29	Calcium as Ca	mg/L	--	581	602	578	592	505	--	590	612	612	640	586
30	Chloride as Cl	mg/L	--	22864	23128	22415	22843	22142	--	21997	23006	22098	23001	22640
31	Cyanide as CN	mg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
32	Fluoride as F	mg/L	--	0.75	0.81	0.93	0.88	0.79	--	0.66	0.76	0.85	0.93	0.81
33	Magnesium as Mg	mg/L	--	1256	1398	1304	1396	1310	--	1272	1355	1290	1358	1324
34	Total Iron as Fe	mg/L	--	0.74	0.86	1.24	1.4	1.28	--	0.81	0.89	1.07	1.07	1.15
35	Residual Free Chlorine	mg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
36	Phenolic Compounds as C6H5OH	mg/L	--	BDL(DL 1.0)					--	BDL(DL 1.0)				
37	Total Hardness as CaCO3	mg/L	--	5937	7330	6878	7297	6721	--	6017	7176	6905	7258	6982
38	Total Alkalinity as CaCO3	mg/L	--	289	256	235	252	218	--	280	263	251	275	237
39	Sulphide as H2S	mg/L	--	BDL(DL 0.5)					--	BDL(DL 0.5)				
40	Sulphate as SO4	mg/L	--	2496	2618	2321	2378	2046	--	2529	2700	2376	2503	2503

41	Anionic surfactants as MBAS	mg/L	--	BDL(DL 1.0)					--	BDL(DL 1.0)				
42	Monocrotophos	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
43	Atrazine	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
44	Ethion	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
45	Chiorpyrifos	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
46	Phorate	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
47	Mehyle parathion	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
48	Malathion	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
49	DDT (o,p and p,p-isomers of DDT,DDE and DDD	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
50	Gamma HCH (Lindane)	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
51	Alppha HCH	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
52	Beta HCH	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
53	Delta HCH	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
54	Endosulfan (Alpha,beta and	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
55	Butachlor	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
56	Alachlor	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
57	Aldrin/Dieldrin	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
58	Isoproturon	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
59	2,4-D	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
60	Polychlorinated Biphenyls (PCB)	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
61	Polynuclear aromatic hydrocarbons (PAH)	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
62	Arsenic as As	mg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
63	Mercury as Hg	mg/L	--	BDL(DL 0.001)					--	BDL(DL 0.001)				
64	Cadmium as Cd	mg/L	--	BDL(DL 0.003)					--	BDL(DL 0.003)				
65	Total Chromium as Cr	mg/L	--	BDL(DL 0.05)					--	BDL(DL 0.05)				
66	Copper as Cu	mg/L	--	BDL(DL 0.05)					--	BDL(DL 0.05)				
67	Lead as Pb	mg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
68	Manganese as Mn	mg/L	--	BDL(DL 0.05)					--	BDL(DL 0.05)				
69	Nickel as Ni	mg/L	--	BDL(DL 0.05)					--	BDL(DL 0.05)				
70	Selenium as Se	mg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
71	Barium as Ba	mg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
72	Silver as Ag	mg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
73	Molybdenum as Mo	mg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
74	Octane	µg/L	--	183	190	174	170	161	--	174	185	169	182	174
75	Nonane	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
76	Decane	µg/L	--	BDL(DL 0.01)					--	BDL(DL 0.01)				
77	Undecane	µg/L	--	8.2	8.8	8	8.5	8.9	--	7.9	8.3	6.8	7.6	8.5
78	Tridecane	µg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
79	Tetradecane	µg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
80	Pentadecane	µg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
81	Hexadecane	µg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				

Location			CB - 1 Bottom Water						CB - 2 Bottom Water					
Month & Year		Unit	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
S.No.	Parameters		--						--					
82	Heptadecane	µg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
83	Octadecane	µg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
84	Nonadecane	µg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
85	Elcosane	µg/L	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
86	Primary Productivity	mg C/m^3 /hr	--	8.56	10.12	8.91	9.01	9.93	--	8.61	9.94	9.35	7.69	9.18
87	Chlorophyll a	mg /m^3	--	3.98	5.67	3.42	3.96	6.15	--	4.32	6.36	4.01	4.12	4.97
88	Phaeophytin	mg /m^3	--	0.74	0.78	0.78	0.72	0.98	--	0.83	0.89	0.93	0.64	0.92
89	Oxidisable Paticular Organic	mg /L	--	4.83	6.91	5.42	4.48	6.56	--	4.94	6.07	5.27	5.15	4.83
				PHYTOPLANKTON										
90	Bacteriastrum hyalinum	nos/ml	--	21	17	15	20	16	--	23	16	18	16	18
91	Bacteriastrum varians	nos/ml	--	13	10	9	10	12	--	10	18	11	12	15
92	Chaetoceros didymus	nos/ml	--	18	11	12	9	15	--	19	13	14	8	11
93	Chaetoceros decipiens	nos/ml	--	9	13	9	14	10	--	15	11	12	13	9
94	Biddulphia mobiliensis	nos/ml	--	14	18	8	7	17	--	21	15	15	11	14
95	Ditylum brightwellii	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
96	Gyrosigma sp	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
97	Cladophyxis sps	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
98	Coscinodiscus centralis	nos/ml	--	18	19	10	12	16	--	14	17	13	10	13
99	Coscinodiscus granii	nos/ml	--	15	12	11	6	18	--	23	20	8	7	10
100	Cylcotella sps	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
101	Hemidiscus hardmanianus	nos/ml	--	19	8	6	9	14	--	25	22	9	4	12
102	Laudaria annulata	nos/ml	--	15	10	5	12	19	--	12	14	10	9	16
103	Pyropacus horologicum	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
104	Pleurosigma angulatum	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
105	Leptocylindrus danicus	nos/ml	--	17	12	17	5	8	--	23	17	12	7	4
106	Guinardia flaccida	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
107	Rhizosolenia alata	nos/ml	--	25	21	13	16	11	--	17	9	19	18	9
108	Rhizosolena impricata	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
109	Rhizosolena semispina	nos/ml	--	19	23	15	8	13	--	16	19	16	6	15
110	Thalassionema nitzschioides	nos/ml	--	11	15	16	21	24	--	15	20	18	15	19
111	Triceratium reticulatum	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
112	Ceratium trichoceros	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
113	Ceratium furca	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
114	Ceratium macroceros	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
115	Ceracium longipes	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil

ZOOPLANKTONS														
116	Acrocalanus gracilis	nos/ml	--	15	14	17	15	10	--	16	20	16	12	16
117	Acrocalanus sp	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
118	Paracalanus parvus	nos/ml	--	14	19	11	12	14	--	13	15	17	14	18
119	Eutintinus sps	nos/ml	--	7	12	10	9	7	--	10	6	12	10	6
120	Centropages furcatus	nos/ml	--	11	15	8	18	15	--	8	12	14	8	12
121	Corycaeus dana	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
122	Oithona brevicornis	nos/ml	--	15	11	15	17	19	--	12	19	13	16	20
123	Euterpina acutifrons	nos/ml	--	9	16	6	10	16	--	14	21	7	13	17
124	Metacalanus aurivilli	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
125	Copipod nauplii	nos/ml	--	17	22	8	11	12	--	16	13	19	21	19
126	Cirripede nauplii	nos/ml	--	Nil	Nil	Nil	Nil	Nil	--	Nil	Nil	Nil	Nil	Nil
127	Bivalve veliger	nos/ml	--	14	10	13	11	17	--	17	20	18	11	24
128	Gastropod veliger	nos/ml	--	20	24	18	20	23	--	11	17	15	9	22

SEA SEDIMENT														
Location			CB - 1 Sea Sediment						CB - 2 Sea Sediment					
Month & Year		Unit	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
S.No.	Parameters													
1	Total organic matter	%	--	0.51	0.55	0.49	0.55	0.58	--	0.49	0.57	0.58	0.52	0.56
2	% Sand	%	--	28	26	24	26	22	--	25	24	22	24	20
3	%silt	%	--	22	21	22	23	21	--	20	22	20	22	24
4	%Clay	%	--	50	53	54	51	57	--	55	54	58	54	56
5	Iron (as Fe)	mg/kg	--	23.9	22.8	24.6	26.8	27.5	--	21.7	23.6	25.1	26	28.1
6	Aluminium (as Al)	mg/kg	--	11142	11567	11033	10152	11643	--	11286	11474	10089	10568	10989
7	Chromium (as cr)	mg/kg	--	70	79	71	78	70	--	75	70	59	65	77
8	Copper (as cu)	mg/kg	--	81	69	82	69	85	--	86	77	71	63	78
9	Manganese (as Mn)	mg/kg	--	255	233	202	246	264	--	268	249	227	238	254
10	Nickel (as Ni)	mg/kg	--	14.5	12.3	13.9	11.5	14.6	--	13.7	14.3	14.8	13.2	13.9
11	Lead (as Pb)	mg/kg	--	57	61	53	47	41	--	52	58	49	44	38
12	Zinc (as Zn)	mg/kg	--	268	293	218	256	251	--	275	264	271	240	274
13	Mercury(as Hg)	mg/kg	--	0.55	0.58	0.51	0.49	0.42	--	0.62	0.69	0.57	0.47	0.45
14	Total phosphorus as P	mg/kg	--	135	146	155	150	155	--	140	145	151	159	147
15	Octane	mg/kg	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
16	Nonane	mg/kg	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
17	Decane	mg/kg	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
18	Undecane	mg/kg	--	0.7	0.83	0.77	0.91	0.78	--	0.75	0.8	0.86	0.83	0.75
19	Dodecane	mg/kg	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
20	Tridecane	mg/kg	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
21	Tetradecane	mg/kg	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
22	Phntadecane	mg/kg	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
23	Hexadecane	mg/kg	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
24	Heptadecane	mg/kg	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
25	Octadecane	mg/kg	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
26	Nonadecane	mg/kg	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
27	Elcosane	mg/kg	--	BDL(DL 0.1)					--	BDL(DL 0.1)				
I. Nematoda														
28	Oncholaimussp	nos/m^2	--	17	11	14	10	12	--	21	17	10	8	11
29	Tricomasp	nos/m^2	--	14	9	11	15	17	--	15	12	15	12	14
II. Foraminifera														
30	Ammoniabeccarii	nos/m^2	--	13	18	13	18	11	--	11	14	16	10	16
31	Quinqulinasp	nos/m^2	--	22	25	20	12	16	--	19	22	18	13	10
32	Discorbinellasp.,	nos/m^2	--	18	14	9	14	9	--	26	18	11	17	15
33	Bolivinaspathulata	nos/m^2	--	15	17	7	11	14	--	18	15	9	9	13
34	Elphidiumsp	nos/m^2	--	10	19	12	16	18	--	12	10	17	20	21
35	Noniondepressula	nos/m^2	--	16	21	26	22	24	--	14	19	23	18	25
III. Molluscs-Bivalvia														
36	Meretrixveligers	nos/m^2	--	11	13	18	13	15	--	13	16	9	16	12
37	Anadaraveligers	nos/m^2	--	9	15	10	17	18	--	20	23	14	21	23
	Total No. of individuals	nos/m^2	--	145	167	134	148	154	--	149	166	142	144	160
	Shanon Weaver Diversity		--	2.27	2.26	2.25	2.28	2.27	--	2.28	2.27	2.26	2.25	2.26
MARINE WATER														

Location		Berth - 3 Surface Water						
Month & Year		Unit	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
S.No.	Parameters							
1	pH @ 25°C	-	--	7.83	8.09	7.81	8.13	7.91
2	Temperature	°C	--	29	29	29	29	29
3	Total Suspended Solids	mg/L	--	22	25	29	24	22
4	BOD at 27 °C for 3 days	mg/L	--	25	29	22	20	18
5	Dissolved oxygen	mg/L	--	3.3	3.1	3.4	3.8	3.6
6	Salinity at 25 °C	-	--	40.9	41.7	40.1	40.6	41.3
7	Oil & Grease	mg/L	--	BDL(DL 1.0)				
8	Nitrate as No_3	mg/L	--	8.12	6.98	8.15	7.29	5.98
9	Nitrite as No_2	mg/L	--	6.96	5.14	5.87	4.56	4.12
10	Ammonical Nitrogen as N	mg/L	--	BDL(DL 1.0)				
11	Ammonia as NH3	mg/L	--	BDL(DL 0.01)				
12	Kjeldahl Nitrogen as N	mg/L	--	BDL(DL 1.0)				
13	Total phosphates as PO4	mg/L	--	3.98	4.76	5.63	6.08	7.41
14	Total Nitrogen	mg/L	--	BDL(DL 1.0)				
15	Total Dissolved Solids	mg/L	--	40986	42019	40918	41644	42098
16	COD	mg/L	--	105	121	136	125	141
17	Total bacterial count	cfu/ml	--	69	75	70	80	98
18	Coliforms	Per 100 ml	--	Absence				
19	Escherichia coli	Per 100 ml	--	Absence				
20	Salmonella	Per 100 ml	--	Absence				
21	Shigella	Per 100 ml	--	Absence				
22	Vibrio cholerae	Per 100 ml	--	Absence				
23	Vibrio parahaemolyticus	Per 100 ml	--	Absence				
24	Enterococci	Per 100 ml	--	Absence				
25	Octane	µg/L	--	158	164	181	165	173
26	Nonane	µg/L	--	BDL(DL 0.1)				
27	Decane	µg/L	--	BDL(DL 0.1)				
28	Undecane	µg/L	--	BDL(DL 0.1)				
29	Tridecane	µg/L	--	7.2	8.6	7.3	6.7	7.4
30	Tetradecane	µg/L	--	BDL(DL 0.1)				
31	Pentadecane	µg/L	--	BDL(DL 0.1)				
32	Hexadecane	µg/L	--	BDL(DL 0.1)				
33	Octadecane	µg/L	--	BDL(DL 0.1)				
34	Nonadecane	µg/L	--	BDL(DL 0.1)				
35	Elcosane	µg/L	--	BDL(DL 0.1)				
36	Primary Productivity	mg C/m^3 /hr	--	9.51	8.43	7.93	8.25	8.38
37	Chlorophyll a	mg /m^3	--	5.1	5.75	6.01	6.78	6.01
38	Phaeophytin	mg /m^3	--	0.94	0.73	0.74	0.86	0.79
39	Oxidisable Paticular Organic	mg /L	--	5.18	6.91	5.86	4.23	4.96
	PHYTOPLANKTON							
40	Bacteriastrum hyalinum	nos/ml	--	17	13	11	14	11
41	Bacteriastrum varians	nos/ml	--	12	10	6	9	14
42	Chaetoceros didymus	nos/ml	--	8	15	8	11	13
43	Chaetoceros decipiens	nos/ml	--	14	11	2	6	9
44	Biddulphia mobiliensis	nos/ml	--	9	7	9	15	12
45	Ditylum brightwellii	nos/ml	--	Nil	Nil	Nil	Nil	Nil
46	Gyrosigma sp	nos/ml	--	10	16	Nil	Nil	Nil
47	Cladophyxis sps	nos/ml	--	Nil	Nil	Nil	Nil	Nil
48	Coscinodiscus centralis	nos/ml	--	7	9	12	10	8
49	Coscinodiscus granii	nos/ml	--	11	14	5	12	17
50	Cylcotella sps	nos/ml	--	Nil	Nil	Nil	Nil	Nil
51	Hemidiscus hardmanianus	nos/ml	--	15	12	8	5	7
52	Laudaria annulata	nos/ml	--	12	8	Nil	Nil	Nil
53	Pyropacus horologicum	nos/ml	--	Nil	Nil	Nil	Nil	Nil
54	Pleurosigma angulatum	nos/ml	--	Nil	Nil	Nil	Nil	Nil
55	Leptocylindrus danicus	nos/ml	--	13	19	10	13	15
56	Guinardia flaccida	nos/ml	--	Nil	Nil	Nil	Nil	Nil
57	Rhizosolenia alata	nos/ml	--	6	11	7	4	7
58	Rhizosolena impricata	nos/ml	--	Nil	Nil	Nil	Nil	Nil
59	Rhizosolena semispina	nos/ml	--	10	15	14	16	21
60	Thalassionema nitzschioides	nos/ml	--	16	21	8	10	13
61	Triceratium reticulatum	nos/ml	--	Nil	Nil	Nil	Nil	Nil
62	Ceratium trichoceros	nos/ml	--	Nil	Nil	Nil	Nil	Nil
63	Ceratium furca	nos/ml	--	Nil	Nil	Nil	Nil	Nil
64	Ceratium macroceros	nos/ml	--	Nil	Nil	Nil	Nil	Nil
65	Ceracium longipes	nos/ml	--	Nil	Nil	Nil	Nil	Nil

ZOOPLANKTONS								
66	Acrocalanus gracilis	nos/ml	--	10	13	12	8	12
67	Acrocalanus sp	nos/ml	--	Nil	Nil	Nil	Nil	Nil
68	Paracalanus parvus	nos/ml	--	17	11	10	11	14
69	Eutintinus sps	nos/ml	--	15	19	6	9	11
70	Centropages furcatus	nos/ml	--	12	8	11	7	9
71	Corycaeus dana	nos/ml	--	Nil	Nil	Nil	Nil	Nil
72	Oithona brevicornis	nos/ml	--	9	15	13	17	20
73	Euterpina acutifrons	nos/ml	--	11	14	8	10	13
74	Metacalanus aurivilli	nos/ml	--	Nil	Nil	Nil	Nil	Nil
75	Copipod nauplii	nos/ml	--	13	16	9	12	15
76	Cirripede nauplii	nos/ml	--	Nil	Nil	Nil	Nil	Nil
77	Bivalve veliger	nos/ml	--	8	10	5	8	10
78	Gastropod veliger	nos/ml	--	14	17	14	18	16

Location		Berth - 3 Bottom Water						
Month & Year		Unit	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
S.No.	Parameters							
1	pH @ 25°C	-	--	8.05	8.48	7.94	8.21	8.05
2	Temperature	°C	--	29	29	29	29	29
3	Total Suspended Solids	mg/L	--	30	37	35	31	33
4	BOD at 27 °C for 3 days	mg/L	--	34	36	29	26	22
5	Dissolved oxygen	mg/L	--	2.6	2.8	3	3.2	3.4
6	Salinity at 25 °C	ppt	--	41.1	41.9	38.8	40.3	41.2
7	Oil & Grease	mg/L	--	BDL(DL 1.0)				
8	Nitrate as No_3	mg/L	--	6.86	6.05	7.42	7.95	7.08
9	Nitrite as No_2	mg/L	--	4.91	4.76	5.95	6.74	5.75
10	Ammonical Nitrogen as N	mg/L	--	BDL(DL 1.0)				
11	Ammonia as NH3	mg/L	--	BDL(DL 0.01)				
12	Kjeldahl Nitrogen as N	mg/L	--	BDL(DL 1.0)				
13	Total phosphates as PO4	mg/L	--	5.21	5.91	5.17	5.68	6.44
14	Total Nitrogen	mg/L	--	BDL(DL 1.0)				
15	Total Dissolved Solids	mg/L	--	42546	43567	40982	42014	42881
16	COD	mg/L	--	114	131	137	148	162
17	Total bacterial count	cfu/ml	--	70	84	90	120	140
18	Coliforms	Per 100 ml	--	Absence				
19	Escherichia coli	Per 100 ml	--	Absence				
20	Salmonella	Per 100 ml	--	Absence				
21	Shigella	Per 100 ml	--	Absence				
22	Vibrio cholerae	Per 100 ml	--	Absence				
23	Vibrio parahaemolyticus	Per 100 ml	--	Absence				
24	Enterococci	Per 100 ml	--	Absence				
25	Colour	Hazan	--	15	20	25	30	20
26	Odour	-	--	Unobjectionable				
27	Taste	-	--	Disagreeable				
28	Turbidity	NTU	--	42	48	43	46	48
29	Calcium as Ca	mg/L	--	571	597	539	602	630
30	Chloride as Cl	mg/L	--	22754	23215	21490	22317	22806
31	Cyanide as CN	mg/L	--	BDL(DL 0.01)				
32	Fluoride as F	mg/L	--	0.71	0.83	0.97	0.74	0.79
33	Magnesium as Mg	mg/L	--	1542	1602	1544	1621	1698
34	Total Iron as Fe	mg/L	--	0.75	0.75	0.83	1.09	1.32
35	Residual Free Chlorine	mg/L	--	BDL(DL 0.1)				

35	Residual Free Chlorine	mg/L	--	BDL(DL 0.1)				
36	Phenolic Compounds as C6H5OH	mg/L	--	BDL(DL 1.0)				
37	Total Hardness as CaCO3	mg/L	--	6934	8167	7780	8259	8650
38	Total Alkalinity as CaCO3	mg/L	--	321	308	266	281	261
39	Sulphide as H2S	mg/L	--	BDL(DL 0.5)				
40	Sulphate as SO4	mg/L	--	2017	2281	1904	2203	2286
41	Anionic surfactants as MBAS	mg/L	--	BDL(DL 1.0)				
42	Monocrotophos	µg/L	--	BDL(DL 0.01)				
43	Atrazine	µg/L	--	BDL(DL 0.01)				
44	Ethion	µg/L	--	BDL(DL 0.01)				
45	Chiorpyrifos	µg/L	--	BDL(DL 0.01)				
46	Phorate	µg/L	--	BDL(DL 0.01)				
47	Mehyle parathion	µg/L	--	BDL(DL 0.01)				
48	Malathion	µg/L	--	BDL(DL 0.01)				
49	DDT,DDE and DDD	µg/L	--	BDL(DL 0.01)				
50	Gamma HCH (Lindane)	µg/L	--	BDL(DL 0.01)				
51	Alppha HCH	µg/L	--	BDL(DL 0.01)				
52	Beta HCH	µg/L	--	BDL(DL 0.01)				
53	Delta HCH	µg/L	--	BDL(DL 0.01)				
54	sulphate)	µg/L	--	BDL(DL 0.01)				
55	Butachlor	µg/L	--	BDL(DL 0.01)				
56	Alachlor	µg/L	--	BDL(DL 0.01)				
57	Aldrin/Dieldrin	µg/L	--	BDL(DL 0.01)				
58	Isoproturon	µg/L	--	BDL(DL 0.01)				
59	2,4-D	µg/L	--	BDL(DL 0.01)				
60	Polychlorinated Biphenyls (PCB)	µg/L	--	BDL(DL 0.01)				
61	(PAH)	µg/L	--	BDL(DL 0.01)				
62	Arsenic as As	mg/L	--	BDL(DL 0.01)				
63	Mercury as Hg	mg/L	--	BDL(DL 0.001)				
64	Cadmium as Cd	mg/L	--	BDL(DL 0.003)				
65	Total Chromium as Cr	mg/L	--	BDL(DL 0.05)				
66	Copper as Cu	mg/L	--	BDL(DL 0.05)				
67	Lead as Pb	mg/L	--	BDL(DL 0.01)				
68	Manganese as Mn	mg/L	--	BDL(DL 0.05)				
69	Nickel as Ni	mg/L	--	BDL(DL 0.05)				
70	Selenium as Se	mg/L	--	BDL(DL 0.01)				
71	Barium as Ba	mg/L	--	BDL(DL 0.1)				
72	Silver as Ag	mg/L	--	BDL(DL 0.01)				
73	Molybdenum as Mo	mg/L	--	BDL(DL 0.01)				
74	Octane	µg/L	--	163	187	160	178	155
75	Nonane	µg/L	--	BDL(DL 0.1)				
76	Decane	µg/L	--	BDL(DL 0.1)				
77	Undecane	µg/L	--	7.9	8.9	7.1	8.6	7
78	Tridecane	µg/L	--	BDL(DL 0.1)				
79	Tetradecane	µg/L	--	BDL(DL 0.1)				
80	Pentadecane	µg/L	--	BDL(DL 0.1)				
81	Hexadecane	µg/L	--	BDL(DL 0.1)				

Month & Year		Unit	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
S.No.	Parameters		--					
82	Heptadecane	µg/L	--	BDL(DL 0.1)				
83	Octadecane	µg/L	--	BDL(DL 0.1)				
84	Nonadecane	µg/L	--	BDL(DL 0.1)				
85	Elcosane	µg/L	--	BDL(DL 0.1)				
86	Primary Productivity	mg C/m^3 /hr	--	9.42	9.02	9.26	9.91	9.14
87	Chlorophyll a	mg /m^3	--	5.03	5.86	5.12	7.02	7.96
88	Phaeophytin	mg /m^3	--	0.91	0.8	0.95	0.98	0.8
89	Oxidisable Paticular Organic carbon	mg /L	--	5.06	7.44	7.58	5.46	5.72

			PHYTOPLANKTON					
90	Bacteriastrum hyalinum	nos/ml	--	14	17	15	17	15
91	Bacteriastrum varians	nos/ml	--	10	13	10	13	17
92	Chaetoceros didymus	nos/ml	--	17	21	11	15	18
93	Chaetoceros decipiens	nos/ml	--	12	15	6	8	11
94	Biddulphia mobiliensis	nos/ml	--	11	9	13	18	16
95	Ditylum brightwellii	nos/ml	--	Nil	Nil	Nil	Nil	Nil
96	Gyrosigma sp	nos/ml	--	Nil	Nil	Nil	Nil	Nil
97	Cladophyxis sps	nos/ml	--	Nil	Nil	Nil	Nil	Nil
98	Coscinodiscus centralis	nos/ml	--	13	10	9	11	10
99	Coscinodiscus granii	nos/ml	--	9	12	7	16	21
100	Cylcotella sps	nos/ml	--	Nil	Nil	Nil	Nil	Nil
101	Hemidiscus hardmanianus	nos/ml	--	18	14	10	8	12
102	Laudaria annulata	nos/ml	--	8	11	Nil	Nil	Nil
103	Pyropacus horologicum	nos/ml	--	Nil	Nil	Nil	Nil	Nil
104	Pleurosigma angulatum	nos/ml	--	Nil	Nil	Nil	Nil	Nil
105	Leptocylindrus danicus	nos/ml	--	11	17	8	14	19
106	Guinardia flaccida	nos/ml	--	Nil	Nil	Nil	Nil	Nil
107	Rhizosolenia alata	nos/ml	--	7	15	11	10	9
108	Rhizosolena impricata	nos/ml	--	Nil	Nil	Nil	Nil	Nil
109	Rhizosolena semispina	nos/ml	--	15	19	17	20	24
110	Thalassionema nitzschioides	nos/ml	--	18	23	5	7	16
111	Triceratium reticulatum	nos/ml	--	Nil	Nil	Nil	Nil	Nil
112	Ceratium trichoceros	nos/ml	--	Nil	Nil	Nil	Nil	Nil
113	Ceratium furca	nos/ml	--	Nil	Nil	Nil	Nil	Nil
114	Ceratium macroceros	nos/ml	--	Nil	Nil	Nil	Nil	Nil
115	Ceracium longipes	nos/ml	--	Nil	Nil	Nil	Nil	Nil
			ZOOPLANKTONS					
116	Acrocalanus gracilis	nos/ml	--	13	17	15	11	7
117	Acrocalanus sp	nos/ml	--	Nil	Nil	Nil	Nil	Nil
118	Paracalanus parvus	nos/ml	--	15	14	12	14	18
119	Eutintinus sps	nos/ml	--	12	22	10	16	14
120	Centropages furcatus	nos/ml	--	14	11	8	12	15
121	Corycaeus dana	nos/ml	--	Nil	Nil	Nil	Nil	Nil
122	Oithona brevicornis	nos/ml	--	11	16	17	21	23
123	Euterpina acutifrons	nos/ml	--	9	12	9	14	17
124	Metacalanus aurivilli	nos/ml	--	Nil	Nil	Nil	Nil	Nil
125	Copipod nauplii	nos/ml	--	16	19	13	17	19
126	Cirripede nauplii	nos/ml	--	Nil	Nil	Nil	Nil	Nil
127	Bivalve veliger	nos/ml	--	10	13	7	10	12
128	Gastropod veliger	nos/ml	--	17	20	11	15	11

Location		Berth - 3 Sea Sediment						
Month & Year		Unit	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
S.No.	Parameters							
1	Total organic matter	%	--	0.53	0.51	0.44	0.5	0.54
2	% Sand	%	--	27	25	26	25	27
3	%silt	%	--	24	23	21	23	25
4	%Clay	%	--	49	52	53	52	48
5	Iron (as Fe)	mg/kg	--	23.1	21.9	23.7	24.9	26.9
6	Aluminium (as Al)	mg/kg	--	10002	11081	11248	11006	10055
7	Chromium (as cr)	mg/kg	--	79	72	64	60	73
8	Copper (as cu)	mg/kg	--	64	80	87	77	71
9	Manganese (as Mn)	mg/kg	--	301	286	250	241	270
10	Nickel (as Ni)	mg/kg	--	13.3	15.2	14.1	14.9	15.2
11	Lead (as Pb)	mg/kg	--	54	67	60	55	47
12	Zinc (as Zn)	mg/kg	--	286	252	288	268	243
13	Mercury(as Hg)	mg/kg	--	0.61	0.54	0.63	0.56	0.51
14	Total phosphorus as P	mg/kg	--	128	135	148	162	151
15	Octane	mg/kg	--	BDL(DL 0.1)				
16	Nonane	mg/kg	--	BDL(DL 0.1)				
17	Decane	mg/kg	--	BDL(DL 0.1)				
18	Undecane	mg/kg	--	0.72	0.76	0.82	0.89	0.8
19	Dodecane	mg/kg	--	BDL(DL 0.1)				
20	Tridecane	mg/kg	--	BDL(DL 0.1)				
21	Tetradecane	mg/kg	--	BDL(DL 0.1)				
22	Phntadecane	mg/kg	--	BDL(DL 0.1)				
23	Hexadecane	mg/kg	--	BDL(DL 0.1)				
24	Heptadecane	mg/kg	--	BDL(DL 0.1)				
25	Octadecane	mg/kg	--	BDL(DL 0.1)				
26	Nonadecane	mg/kg	--	BDL(DL 0.1)				
27	Elcosane	mg/kg	--	BDL(DL 0.1)				
I. Nematoda								
28	Oncholaimussp	nos/m^2	--	24	21	17	12	15
29	Tricomasp	nos/m^2	--	10	15	8	14	10
II. Foraminifera								
30	Ammoniabeccarii	nos/m^2	--	14	9	14	17	13
31	Quinqulinasp	nos/m^2	--	20	17	22	15	11
32	Discorbinellasp.,	nos/m^2	--	17	13	10	7	12
33	Bolivinaspathulata	nos/m^2	--	11	16	12	18	16
34	Elphidiumsp	nos/m^2	--	15	18	15	22	19
35	Noniondepressula	nos/m^2	--	12	14	19	11	20
III. Molluscs-Bivalvia								
36	Meretrixveligers	nos/m^2	--	16	20	16	10	14
37	Anadoraveligers	nos/m^2	--	28	21	13	19	22
	Total No. of individuals	nos/m^2	--	167	164	146	145	152
	Shanon Weaver Diversity Index		--	2.25	2.28	2.27	2.26	2.27

adani Ports and Logistics	Marine Infrastructure Developer Pvt Ltd	From : April 2020 To : September 2020

Compliance to Tamil Nadu Coastal Zone Management Authority (TNCZMA) Conditions vide letter no. 6064/EC.3/2014-1 dated 26.06.2014

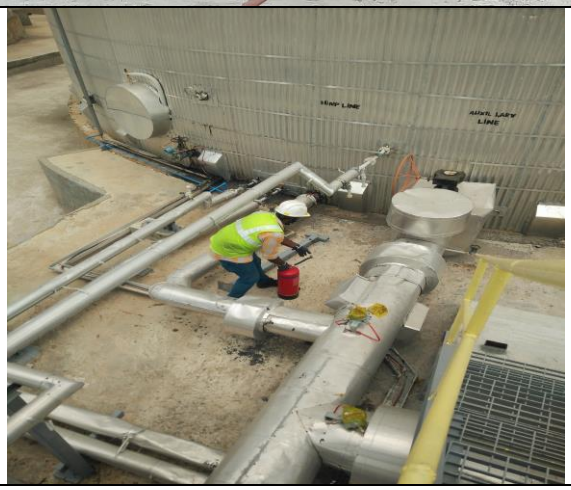
Annexure – 4

Sl. No	Conditions	Compliance
i	The unit shall compliance with all the conditions stipulated in Environment Clearance issued in No. 10-130/2007-IA-III, Ministry of Environment & Forest, Government of India, dated 3rd July 2009	**Being complied**
ii	The proposed activities should not cause coastal erosion and alter the beach configuration. The shoreline changes shall be monitored continuously	**Being Complied.** In past, LTSB has been continuously monitoring shoreline studies through Institute of Ocean Management, Anna University, Chennai. Further, MIDPL also engaged Institute of Ocean Management, Anna University, Chennai. for shoreline studies of the concerned area. Shoreline Change Monitoring Report is submitted along with the Half Yearly Compliance Report for the period Oct'19-Mar'20 vide our Letter No. MIDPL/EC-HYC/2020/11 dated 31.05.2020.
iii	Chemical waste generated and the sewage generated, if any should not be discharged in to the sea and shall be properly handled	**Complied** No chemical waste is generated. Sewage wastewater generated is being treated in STP for further usage in horticulture / greenbelt.
iv	The waste water generated shall be collected, treated and reused properly	**Complied.** Domestic wastewater generated is being treated in STP's. Treated water is being reused for Horticulture / green belt purpose.
v	The proponent shall implement oil spill mitigation measures without fail	**Complied.** Oil Spill contingency plan (OSCP) has been prepared and is being implemented at site. OSCP along with list of Oil spill control equipment already submitted vide our Letter No. MIDPL/TNPCB/GMP/EC-HYC dated 14.05.2018.
vi	Disaster management plan shall be implemented and mock drills shall be carried out properly and periodically.	**Complied** MIDPL has already formulated detailed Disaster Preparedness & Management Plan to handle any Natural and industrial hazards at site. Regular Mock Drills are conducted as per the Crisis Management Plan. The details of drills conducted towards dock safety for the period Apr-2020 to Sep-2020 is enclosed as **Annexure- 5.**

Annexure – V

MOCK DRILL DETAILS

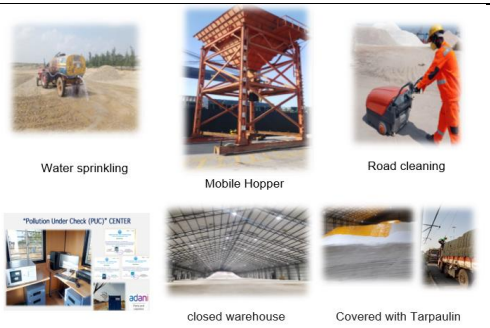
Mock Drills - Apr-2020 to Sep-2020				
S.No.	**Date**	**Time**	**Scenario**	**Participants**
1	28.05.2020	13:30	Procedure to be employed in case of suspected Covid-19 case	7
2	16.06.2020	16:45	Minor fire at the backside of CFS warehouse	8
3	26.07.2020	16:00	A Security Guard was bitten by a scorpion at the main gate.	7
4	21.08.2020	11:41	Minor fire at isolation valve of Enclosure-1 tank No: 8	36



Annexure – VI

EMP COMPLIANCE STATUS

EMP (OPERATIONAL PHASE) - COMPLIANCE STATUS				
S.No.	**Activity**	**Relevant Environmental components likely to be impacted**	**Proposed Mitigation Measures**	**Compliance Status**
1.	Cargo handling and Inland Cargo movement and storage areas	Air Quality	• Use of dust suppression system etc., • Use of low Sulphur diesel fuel is proposed • Dust suppression measures at loading/unloading points, storage area and at internal roads • Regularization of truck movement • Periodic cleaning of cargo spills, • Speed regulations for vehicles engaged in transportation • Greenbelt Development	**Complied.** The Major air pollution generated by port activities include vehicle movements, dry cargos operations and other port activities. The following is practiced controlling of air pollutions at port premises: • Water sprinkling on truck path • Mobile Hopper during cargo handling • Road cleaning with sweeping machines • Installed Vehicle Pollution Under Control (PUC) checking facility at Port. • Tarpaulin cover over the dry cargo materials at open yard • Using the closed warehouse for fine dry cargos materials. • Trucks covered with Tarpaulin for dry cargo vehicle movements • Using low Sulphur diesel fuel for DG sets. • Adequate Greenbelt has been developed & is being maintained in the port area. Around 6,050 Nos. of trees has been planted as on date.

				
		Noise	• Personal Protecting Equipment (PPE) • Greenbelt Development • Counselling and traffic regulation	**Complied.** Traffic and noise level control measures is monitored regularly for all vehicle movements like containers, trucks movements and dumpers & other road equipment operating for import /export of cargos at various locations of port premises. Following control measures are implemented at Kattupalli Port for Noise Control. • Adequate Greenbelt development with avenue plantation • DG sets are having acoustic enclosures as per the standard practice. • Musical Horns are completely banned inside the port premises • Vehicle speed are restricted to 20 Km/ Hr. • Adopting latest technology operation to restrict the vehicular movements inside terminal  
		Traffic Addition	• The existing Kattupalli Port site is well connected by existing road and rail. In addition port approach road is developed as a part of initial	**Complied.** Kattupalli Port is well connected by existing road network. All the roads are in good condition to accommodate traffic.

			development. All the roads are in good condition to accommodate traffic.	
2	Aqueous discharges in harbour basin	Marine water quality and ecology	• Ships are prohibited from discharging wastewater, bilge, oil wastes, etc. into the near-shore as well as harbour waters. • Ships would also comply with the MARPOL convention. • As a part of mitigation measure for accidental spillage of Oil, Construction Contractor/ Kattupalli Port n Oil spill contingency plan is prepared and in place. • Provision of waste reception facility Ballast Water • Management Guideline as issued by Ministry of Shipping – India Shall be adhered.	**Complied.** • Ships/vessels calling at port are not permitted to dump any wastes/bilge water/ballast water during the berthing period. The waste reception facilities developed at Kattupalli Port as per the Guidelines issued by Government of India (GoI) and MARPOL regulation is strictly implemented. • Hazardous wastes are handled as per Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 (as amended). Hazardous wastes are disposed through approved TNPCB /CPCB vendor. • Oil Spill contingency Plan is in place and MIDPL is maintaining oil spill equipments as per Coast Guard guidelines and conducting oil spill mock drills at regular intervals. • Management Guideline as issued by Ministry of Shipping – India are being adhered to
3	Cargo and Oil spills	Marine water quality and ecology	• In case of any cargo spillage during transfer from/to ships, it will be attempted to recover the spills. • Oil spill control equipment such as booms / barriers will be provided for containment and skimmers will be provided for recovery. • Response time for shutting down the fuelling, containment and recovery will be quicker.	• Oil Spill contingency Plan is in place and MIDPL is maintaining oil spill equipments as per Coast Guard guidelines and conducting oil spill mock drills at regular intervals.  

4	Maintenance dredging	Maintenance dredging Marine Ecology	• Maintenance dredging material is being disposed of at identified disposal location at sea. • It will be ensured that dumping of the excess/unusable dredge material would be uniform. • Additional Environmental Monitoring Program comprising of monitoring of marine water quality, marine sediment quality and marine ecology will be initiated one week prior to commencement of dredging and will be carried out during the dredging period.	**Complied.** • There was no maintenance dredging activity during the compliance period. • However Marine Water, sediment & ecology is being monitored on regular basis and reports of the same are being submitted to all the concerned authorities. Monitoring report for the period Apr-Sep'20 is attached as Annexure
5	Water Supply	Water resources	• The water requirement proposed activities shall be met by existing water supply as it was considered during initial development	**Complied.** The main source of raw water is from existing Chennai Metropolitan Water Supply and Sewage Board (CMWSSB), Desalination plant, Kattupalli, which is located adjacent to Kattupalli Port.
6	Wastewater Discharge	Water Quality	• Collection of runoff from stock piles and directing into settling tanks • Available Sewage treatment plant within port area will be utilized. • Treated wastewater from STP will be used for irrigating the greenbelt	**Complied.** • Domestic wastewater generated are being collected, treated in STP's and the entire treated sewage water is reused for green belt maintenance.
7	Solid Waste Management	Groundwater and Soil quality	• Composted biodegradable waste will be used as manure in greenbelt. • Other recyclable wastes will be sold.	**Complied.** • 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 (IWMS) and are handled as per 5R principle. • The recyclable and the bio-degradable waste are recycled by the composting method. The compost

				is used in the nursery and for the gardening purposes • Kitchen waste is being disposed to the biogas facility available on site.  
8	Handling of hazardous wastes	Fire accidents due to products handling	• No Hazardous cargo Handling /storage is envisaged • Hazardous wastes (used oil & used battery if any) will be sent to TSDF located at Gummidipoondi, along with other shipyard wastes. The consent for the same was already obtained and the same can be extended. • Medical facilities including first aid will be available for attending to injured workers • Emergency alarms, provision of fire hydrant system and fire station. • Effective Disaster Management Plan (DMP) which covers onsite and offsite emergency plans. • Recovery of spills to the extent possible.	**Complied.** • Being Complied. • Hazardous wastes are handled as per Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 (as amended). Hazardous wastes are disposed through approved TNPCB /CPCB vendor. MIDPL have obtained Hazardous Waste Authorization from TNPCB for handling and disposal of the wastes. • Occupational Health Centre is available at Kattupalli Port on 24 X 7 basis. • Emergency alarms, fire hydrant system and Fire station equipped with Fire Tender and Fire crew are available at Kattupalli Port. • Disaster Management Plan (DMP) is in place which covers both onsite and offsite emergency plans. • MIDPL is equipped with adequate facility for recovery of spills.  

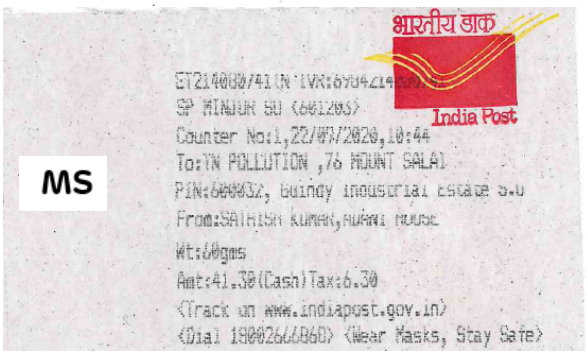
9	Fishing activity	Fishermen livelihood	• The cargo handling activities involved in operation phase are confined to the project area and hence no hindrance to fishing is anticipated Continuing to Educate the fishermen about Port activities • Regular Interactions will be carried out with the fishing community • Conflicts if any with fishing community will be amicably resolved in all cases	**Complied.** • Our activities are confined to approved Port Limits and there is no hindrance to fishing activity.
10	Operation of port – Handling of Proposed Traffic	Socio-economic conditions of the region	The present employment potential of Port is around 250 Nos. and Total Shipyard cum Port is around 2000 nos. The employment potential will increase about 20 nos as direct employment due to proposed activity and will also enhance indirect employment potential in the region. Together with this employment potential, project will help to enhance the socio economic conditions of the area with better schooling, communication and transport facilities that will be developed/ triggered as a part of overall economic development of the region.	**Being Complied.**
		Natural Hazards	The existing Disaster Management Plan (DMP) will be implemented at the time of disaster; COO will act as the overall in-charge of the control of educative, protective and rehabilitation activities to ensure least damage to life and property.	**Noted for Compliance.**
		Induced Development	Offers an efficient and cost effective supply chain/ value proposition to the local importers and exporters in states of Tamil Nadu, Andhra Pradesh, Kerala and Karnataka.	**Being Complied.**

adani
Ports and Logistics

KATTUPALLI PORT
CHENNAI's NEW GATEWAY

Annexure - VII

MIDPL/TNPCB/2020-21/32 **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 Marine Infrastructure Developer Private Limited, Kattupalli Port, Chennai

Ref: 1. Consent Order No. 1907125448424 under Water Act dated 05.07.2019
2. Consent Order No. 1907225448424 under Air Act dated 05.07.2019

With reference to the captioned subject and cited references above, we submit herewith the Environmental Statement of **M/s Marine Infrastructure Developer 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.

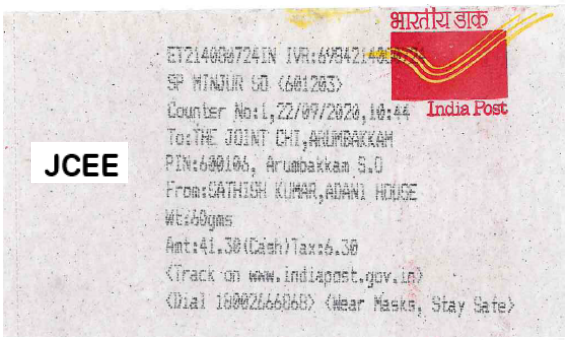
Thanking you,

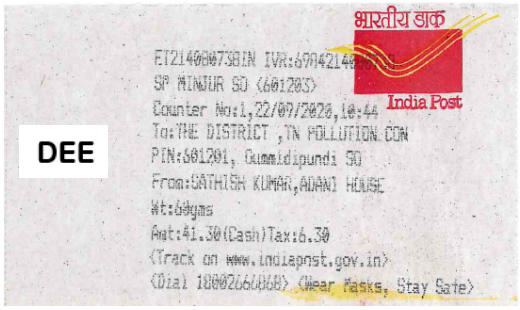
For, **M/s. Marine Infrastructure Developer Private Limited**

21-09-2020

Jai Khurana
Director

Marine Infrastructure Developer Pvt. Ltd. Chennai 600 120





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.

Marine Infrastructure Developer Pvt Ltd
(Kattupalli Port)
Kattupalli Village, Ponneri Taluk,
Tirivalluvar District 600 120,
Tamil Nadu, India

Tel +91 44 2824 3062

CIN: U74999TN2016PTC103769

Sathish Kumar R

From: Sathish Kumar R
Sent: 21 September 2020 12:32
To: 'eccompliance-tn@gov.in'
Cc: Jai Khurana; Milind Sangtiani; Vijayasankar K; Prasanth A
Subject: Submission of Environmental Statement (Form V) for the financial year ending 31st March, 2020 of Marine Infrastructure Developer Private Limited, Kattupalli Port, Chennai - Reg
Attachments: MIDPL - FORM V - FY19-20.pdf

Importance: High

Dear Sir / Madam,

With reference to the captioned subject, we submit herewith the Environmental Statement of **M/s Marine Infrastructure Developer Private Limited, Kattupalli Port, 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** **Director** Marine Infrastructure Developer Private Limited Kattupalli Port, Kattupalli Village, Ponneri Taluk, Thiruvallur District – 600 120 Tamil Nadu, India
ii)	**Industry Category**	:	**Primary** : Red **Secondary:** 1065- Ports & Harbour, Jetties and Dredging Operations.
iii)	**Production Capacity**	:	**Cargo Handling Capacity :** 24.65 MMTPA • Containers - 21.60 MTPA • Ro-Ro (automobiles) - 0.22 MTPA • Project cargo - 0.44 MTPA • Breakbulk / General Cargo (Barytes/ Gypsum/ Limestone/ Granite/ Steel Cargo) - 1.82 MTPA • Edible oil, CBFS, Base Oil, Lube Oil and Non-Hazardous Liquid Cargo - 0.57 MMTPA.
iv)	**Year of establishment**	:	2009 with the issue of Environmental Clearance to L&T Ship Building. Bifurcation of Environmental Clearance of L&T Ship Building to Marine Infrastructure Developer Private Limited on 09th February 2018.
v)	**Date of the last environmental statement submitted**	:	Vide our Letter No. MIDPL/TNPCB/2019-20/09 dated 20.09.2019.

Marine Infrastructure Developer Pvt. Ltd. Chennai 600 120

Part –B

WATER AND RAW MATERIAL CONSUMPTION

(i) Water Consumption

S. No	Water Consumption (m^3/ Day)	During the previous financial year (2018-2019)	During the Current financial year (2019-2020)
1.	Process	NIL	NIL
2.	Cooling	NIL	NIL
3.	Domestic	134.85	138.25

(ii) Raw Material Consumption

S. No	Name of the Raw Material	Name of the Product	Consumption during the financial year 2018 – 19.	Consumption during the 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, dust suppression on roads, Green belt 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 reasons
a) Water	STP Treated Water Characteristics:-		

Parameter	Consent Limit	Actual		% Variation with prescribed standard
		30 KLD	5 KLD	
pH	5.5-9	7.41	7.58	-Nil-
Total Suspended Solids (mg/l)	30	17.08	17.75	-Nil-
BOD (3 days at 27°C) (mg/l)	20	12.42	14.42	-Nil-

Marine Infrastructure Developer Pvt Ltd. Chennai 600 120

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 prescribed 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	• Used oil (5.1) - 19,600 Liters • Sludge and filters contaminated with oil (3.3) - 2.23 MT	• Cargo residue, washing water and sludge containing oil (3.1) - 50.310 T
(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	180 kgs	192 kgs
c)	1. Quantity recycled or reutilized within the Unit	180 kgs	192 kgs
	2. Sold	NIL	NIL
	3. Disposed	NIL	NIL

Marine Infrastructure Developer Pvt Ltd. Chennai 600 120

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 waste includes Cargo residue, washing water and sludge containing oil . 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 and Other Waste (Management & Transboundary Movement) Rules, 2016 (As amended).
- The used batteries and E–waste are stored in Integrated Waste Management Shed and disposed through TNPCB approved vendor.
- Hazardous waste Annual returns in Form 4 was submitted in line with the Hazardous and Other Wastes (Management & Transboundary 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 port are also collected, stored in the Integrated Waste Management Shed and are handled as per 5R principle.

Part-G

Impact on pollution control measures on conservation of natural resources and consequently on the cost of production

- Solar panels of 450 kW were installed at MIDPL and the power generated from solar panel ranges between 55,000-65,000 units per months. MIDPL has invested nearly Rs.2 Crs. for developing this solar plant there by achieved reduction of conventional energy and contributed for resource conservation.
- 15RTGs retrofitted into Electrical power driven system at the project cost of Rs.44 Crs. Key Cost benefits includes reduction in diesel consumption and emission level.
- Sewage Treatment Plants (30 KLD and 5 KLD STPs) are in continuous operation and the treated effluent water quality is meeting the TNPCB norms. STP treated water is

Marine Infrastructure Developer Pvt. Ltd. Chennai 600 120

used for Gardening purpose, thereby reducing freshwater consumption. The total cost spent on STP operation and maintenance during the year 2019-20 is Rs. 14.49 Lakhs.

- Biogas facility was setup at MIDPL to convert the kitchen waste to useful heat energy. The biogas unit generates output of 3kg / day. The plant capacity is 6 cubic meter / day.
- Unit is undertaking Regular Environmental Monitoring in port through NABL accredited laboratory. We have also installed and operating Continuous Ambient Air Quality Monitoring Station (SO2, NOx, CO, PM10&2.5, BTX analyser to monitor VOC) and meteorological station (Wind Speed, Wind Direction, Ambient Temperature, Atmospheric Pressure, Relative Humidity, Rainfall and Solar Radiation). Real time data of CAAQMS is connected to TNPCB server. All the monitored environmental parameters are well within the prescribed standards and the details of monitored data is regularly submitting to TNPCB, CPCB, MoEF&CC and other concerned authorities.
- All the domestic effluent generated at port is treated at existing sewage treatment plants (30 KLD and 5 KLD) and the entire treated sewage water is being reused within port premises for gardening.
- Unit is continuously developing and maintaining green belt within port premises.
- Motion sensor and timers installed at buildings to reduce energy consumption.
- Installation of water saver (water tap filter nozzles) in all wash basin taps – achieved around 4% reduction in water consumption.
- Integrated Waste Management Shed (IWMS) constructed to handle wastes as per 5R principle.
- Installed and operating Vehicle Pollution Under Control (PUC) checking facility to control vehicular emission in port premises.
- RTG Stack monitoring system implemented and achieved energy saving up to 18000 Units per year amounting to Rs. 1.35 L /Year.
- Air conditioners fitted with energy saving device.
- Street light and High mast lighting controlled by light intensity sensor.
- Carried out mass Tree Plantation of 1000 saplings through "Woodlot Planting Technique".

Marine Infrastructure Developer Pvt Ltd. Chennai 600 120

Part-H

Additional investment proposal for environment protection including abatement of pollution, prevention of pollution

Regular Expenditure (cost in INR lakhs/year)		
S. No	**Description**	**Cost**
1	Environmental monitoring of MOEF recognized third party	9.0
2	Green belt & Horticulture development	29.85
3	Annual maintenance contractor of STP operation	14.50
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 to 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)

Marine Infrastructure Developer Pvt Ltd. Chennai 600 120

Name : Jai Khurana
Designation : Director
Address : Marine Infrastructure Developer Private Limited (MIDPL)
Kattupalli Village, Ponneri Taluk,
Thiruvallur District – 600 120
Tamil Nadu, India.

Annexure-1

MIDPL- STACK MONITORING (April'2019 to March'2020)													
Location		DG 2000KVA - 1											
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	241	247	238	245	253	259	267	253	262	269	280	269
2	Flue Gas Velocity, m/s	21.98	19.95	21.63	22.18	22.81	23.57	21.98	23.05	23.68	24.12	25.14	26.35
3	Sulphur Dioxide, mg/Nm3	7.5	8.6	9.1	8.7	9.4	8.8	7.5	7.9	8.5	9.3	8.3	6.9
4	NOX (as NO2) in ppmv	180	188	175	186	195	210	226	220	231	236	248	233
5	Particular matter, mg/Nm3	34.4	31.5	34.1	35.8	32.7	34	32.9	34.3	31	34.2	36.7	34
6	Carbon Monoxide, mg/Nm3	76	81	87	92	98	92	87	80	87	91	98	93
7	Gas Discharge, Nm3/hr	5728	5139	5670	5736	5809	5935	5452	5871	5929	5961	6090	6512

MIDPL- STACK MONITORING (April'2019 to March'2020)													
Location		DG 2000KVA - 2											
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	238	243	231	240	247	252	259	250	257	261	273	260
2	Flue Gas Velocity, m/s	20.87	20.21	20.98	21.73	22.36	22.9	22.16	22.87	23.19	23.75	24.86	25.98
3	Sulphur Dioxide, mg/Nm3	7	7.9	8.4	7.9	8.6	8	8.6	7.4	8	8.8	8	7.2
4	NOX (as NO2) in ppmv	175	182	170	182	191	203	214	218	225	230	242	228
5	Particular matter, mg/Nm3	32.8	33.6	32.3	34	36.2	33.2	31.5	35.7	33.4	31.6	34.3	32.7
6	Carbon Monoxide, mg/Nm3	79	85	89	95	90	96	91	84	89	93	96	90
7	Gas Discharge, Nm3/hr	5471	5246	5576	5674	5760	5843	5580	5858	5861	5957	6099	6529

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