# MONITORING OF ENVIRONMENTAL PLAN FOR JN PORT

# ENVIRONMENTAL MONITORING REPORT-NOVEMBER 2019 EXECUTIVE SUMMARY

## 1.0 Ambient Air Monitoring:

Monthly average values of Air Quality parameters at various stations in JNPT area during November, 2019.

| Parameters | | | Industrial (Port Operation) Area | | | | | | Residential Area | Eco Sensitive Area |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Station Name | | | | | | | |
| | Units | NAAQS | POC | IMC | NG | SEZ | APM | BMCT | RC | EC |
| $PM_{10}$ | µg/m³ | 100 | 122.2 | 167.9 | 171.7 | 151.9 | 170.0 | 147.3 | 82.4 | 53.6 |
| $PM_{2.5}$ | µg/m³ | 60 | 54.1 | 61.6 | 69.2 | 44.7 | 52.9 | 47.7 | 43.5 | 31.6 |
| $SO_x$ | µg/m³ | 80 | 34.6 | 34.8 | 37.4 | 28.1 | 32.3 | 25.5 | 30.6 | 13.8 |
| $NO_x$ | µg/m³ | 80 | 9.5 | 11.9 | 8.3 | 8.6 | 9.0 | 8.5 | 6.0 | 6.3 |
| $O^3$ | µg/m³ | 100 | 10.2 | 9.5 | 9.9 | 9.7 | 10.6 | 9.1 | 9.7 | 8.5 |
| Pb | µg/m³ | 0.5 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| As | ng/m³ | 6 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Ni | ng/m³ | 20 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| $C_6H_6$ | µg/m³ | 5 | 1.2 | 1.3 | 1.4 | 1.2 | 0.9 | 1.4 | 1.1 | 1.0 |
| B(a)P | ng/m³ | 1 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| CO | mg/m³ | 4 | 1.3 | 1.4 | 1.2 | 1.4 | 1.4 | 1.3 | 1.2 | 1.1 |
| $CO_2$ | ppm | - | 274.3 | 274.0 | 278.9 | 279.3 | 282.4 | 260.5 | 264.6 | 234.8 |
| AQI | | | **114.8** | **145.3** | **147.8** | **134.6** | **146.7** | **131.5** | **82.4** | **53.6** |

**Conclusion:**

- 24-hr average concentration of $PM_{10}$, $PM_{2.5}$, $SO_2$ and $NO_2$ and other parameters were measured at eight locations viz. POC, IMC, North Gate, SEZ, APM terminals, BMCT, JNP residential township and EC area using high volume samplers (APM 460 NL and APM 550 MFC).
- During November 2019 overall ambient air quality of the JN Port area is within CPCB permissible limits, except $PM_{10}$ (POC, IMC, NG, SEZ, APM and BMCT) at and $PM_{2.5}$ (IMC, NG) values were found in normal range at all location. To overcome particulate matter problem, the port is using number of precautionary measures, such as maintained a wide expanse of green zone, procured Electric Cart under green port initiatives, initiated Inter-Terminal

Transfer (ITT) of tractor-trailers, switched from diesel to electrically powered e-RTGCs which not just help saving cost but are friendly to environment, installed solar panels on the roof tops of various building in the office premises which cumulatively reduces electricity consumption, the use of LED lights at JNP area, time to time cleaning of paved and unpaved roads, use of tarpaulin sheets to cover dumpers at project sites etc. for cleaner and greener future.

The prominent wind direction (blowing from) was South West (SW) in the port area. average values of wind speed, temperature, relative humidity, solar radiation and total rainfall recorded were 3.33 m/s, 28.19$^0$C, 73.18%, 0.09CCM and 18mm respectively.

**Corrective Action Suggested:**

- Water sprinklers should be used on heavy traffic road to settle the dust particle.
- Dumper carrying construction material and earth filing material must be covered with tarpaulin sheet to reduce dispersal of dust in the air.
- Regular cleaning and time to time collection of wreckage should be done from paved and unpaved road as well construction sites to decrease $PM_{10}$ concentration.
- Road resurfacing should be done to avoid spreading of dust particle in the air.
- Practice should be initiated for using mask as preventative measure, to avoid inhalation of dust particle.
- Each and every vehicles entering into the port region must be strictly checked PUC documents and encourage for regular maintenance of vehicle to minimize emission.
- At JNP Township Green mesh cloth should be used to minimize dust generated during renovation work.
- Avoid excessive idling of automobiles and ships.
- Evacuation of tractor trailers traffic as early as possible.
- New Services and technology like Electric cart, Inter-Terminal Transfer (ITT) are worthy selection to reduce Port operation efficiency and fuel cost.

## 2.0 Marine Water Quality

Observed concentration ranges of Marine Water for various parameters for JNP area during tidal cycle (For November, 2019).

| Sr. | Parameter | Observed | Unit | Prescribed Limits |
|---|---|---|---|---|
| **1** | Temperature | °C | 27.1-31.2 | - |
| **2** | pH | - | 7.65-8.4 | **6.5 - 9.0** |
| **3** | Salinity | ppt | 26.3-32.4 | |

| | | | | |
|---|---|---|---|---|
| **4** | Turbidity | NTU | 22.6-28.7 | - |
| **5** | TDS | mg/L | 21.4-35.8 | - |
| **6** | TSS | mg/L | 29687-35888 | - |
| **7** | TS | mg/L | 203-258 | - |
| **8** | DO | mg/L | 5.14-6.64 | 3.0 mg/L(min.) or 40% of saturation value |
| **9** | COD | mg/L | 64-224 | - |
| **10** | BOD | mg/L | 0.11-2.48 | - |
| **11** | $NH_3$-N | mg/L | 0.569-1 | 5 (max.) |
| **12** | Phenol | mg/L | <0.001 | - |
| **13** | Oil & Grease | mg/L | 0.234-0.902 | - |
| **14** | Total Plate Count | CFU/ml | 79-123 | 10 (max.) |
| **15** | Fecal Coliforms | MPN/100ml | 59-104 | - |

**Conclusion:**

From the above results it is concluded that, the Port's working does not affect the Quality of the Marine water. The overall Marine Water Quality of the Harbour is in good category.

### 3.0 Marine Ecology (Flora and Fauna):

| Sr. No. | Parameter | Observed Range | Criteria |
|---|---|---|---|
| **1** | Net Primary Productivity | 24.75-44.37 mg C/$m^3$/day | <1500 mg C/$m^3$/day at surface |
| **2** | Chlorophyll a | 0.086-4.145 mg/$m^3$ | <4 mg/$m^3$ (Oligotrophic class), 4-10 mg/$m^3$ (Mesotrophic class), >10 mg/$m^3$ (Eutrophic class) |
| **3** | Phosphate | 29-83 µg/L | 0.1-90 µg/L |
| **4** | Nitrate | 15-118 µg/L | 1.0-500 µg/L |
| **5** | Nitrite | <10 µg/L | <125 µg/L |
| **6** | Particulate Organic Carbon | 148-287 mg/$m^3$ | 10-100 mg/$m^3$ |
| **7** | Silicate | 141-197 µg/L | 10-5000 µg/L |

The results obtained from the study for the month of November 2019. Phosphate, Nitrates, Nitrite and Silicate are also well within prescribing standards for ecological parameters for Arabian Sea. Net Primary Productivity and Chlorophyll-a were well within prescribe standards for ecological parameters for Arabian Sea. The values for Particulate Organic Carbon (POC) exceeds the prescribed standards high due to detritus material originating from mangrove swamps, detritus plankton, benthos, fish etc. as well as untreated sewage discharges from nearby municipal corporations, Industrial estates and villages around the area. However, considering the activities in JNP Harbour, it is seen that the marine ecosystem is not adversely affected by Port activities.

**Corrective Action Suggested:**

Proper care should be taken for treatment of sewage and industrial waste before discharging into the open sea by nearby concerned cities, Industrial estates and villages etc.

## 4.0 Drinking Water Quality

The drinking water being supplied to JN Port is safe for drinking purpose. At all drinking water monitoring stations around port area are found to be as per the drinking water specifications given in IS 10500:2012 and also on the basis of analysis parameter.