



Conclusion:

- 24-hr average concentration of PM₁₀, PM_{2.5}, SO₂, NO₂, NH₃ other parameters were measured at ten locations with one continuous and 9 fixed Monitoring station viz. IMC, NG, SEZ, APM, BMCT, CB, DP World, JNP residential township and EC area using high volume air samplers, respirable dust sampler (APM 460 NL and APM 550 MFC) and gaseous sampler and at POC using continuous air quality monitoring station.
- During January, 2022 overall ambient air quality of the JNPT is within CPCB permissible limits except PM₁₀, PM_{2.5} at some locations and NO₂@IMC area is due to cold air that is denser leads to barrier for dispersion for Air Particles as inversion leads to smog-filled days. To improve air quality the port is using number of precautionary measures, such as maintained a wide expanse of Green zone, initiated Inter-Terminal Transfer (ITT) of tractor-trailers, switched from diesel to electrically powered e-RTGCs which not just help saving cost also eco-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 helps in lower energy consumption and decreases the carbon foot prints in the environment, 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.
- JNPT Goes Green by deploys 9 e-vehicles and committed to sustainable growth to reduce the port's impact on the environment and neighboring communities. E-cars are zero-emission vehicles that enable the transition of JN Port to green and energy-efficient mobility solutions.
- JN Port received rainfall around 6.00 mm during January, 2022 and the entire rainfall is 2939.96 mm the prominent wind direction (blowing from) was the North West (NW) in the port area. Average values of wind speed, temperature, relative humidity and solar radiation recorded were 3.82 km/Hr, 26.07°C, 66.53% and 31.00 W/m² respectively. The maximum wind speed recorded was 7.10 Km/Hr.

Solution towards the Green port:

- Practice should be initiated for using mask as preventative measure, to avoid inhalation of dust particle- Mask advised in sensitive areas.
- Air purifier is recommending in Hotspots.
- Awareness for public must be created to reduce the Burning of wood chulha during cold air gusting.
- To avoid airborne disease Port workers must maintain a safe distance from anyone who is coughing or sneezing.
- Use of renewable energy like solar energy should be optimal and ensure to work continuously.
- Display of Environmental Initiative Boards as like JNPT Township, to create awareness

towards public.

- Stay sanitized of public transport and all basic items at public interaction places as much as possible.
- New services and technology like Electric cart, Inter-Terminal Transfer (ITT) are worthy selection to reduce Port operation efficiency and fuel cost.
- Close windows and Door at sensitive areas
- Limit the Activity and time of Exposure in Sensitive Area Prior planning.
- Conventional RTGCs should be altered as E-RTGCs counting inside the port completely.
- New scanning technology and new high power Tugs are reducing operation timing and CO₂ Emission are good creativity.
- Initiate Natural Gas (CNG) only as fuel by all buses and trucks.

2.0 Marine Water Quality

Observed concentration ranges of Marine Water for various parameters for JNP area during tidal cycle (For January, 2022).

Sr.	Parameter	Observed	Unit	Prescribed Limits
1	Temperature	°C	26.3-27.2	-
2	pH	-	6.68-7.18	6.5 - 9.0
3	Salinity	ppt	32.3-33.6	-
4	Turbidity	NTU	23.5-32.6	-
5	TDS	mg/L	30724-40484	-
6	TSS	mg/L	244-344	-
7	TS	mg/L	30996-40776	-
8	DO	mg/L	5.13-6.1	3.0 mg/L(min.) or 40% of saturation value
9	COD	mg/L	24.4-86.0	-
10	BOD	mg/L	1.25-2.79	5 (max.)
11	Ammonia	mg/L	0.026-0.212	-
12	Phenol	mg/L	0.002-0.021	-
13	Oil & Grease	mg/L	0.192-0.678	10 (max.)
14	Total Plate Count	CFU/ml	112-192	-
15	Fecal Coliforms	MPN/100ml	90-665	500 (max.)

Conclusion:

From the above results it can be 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	1.8663-13.2378 mg C/m ³ /day	<1500 mg C/m ³ /day at surface
2	Chlorophyll a	0.0146-0.8544 mg/m ³	<4 mg/m ³ (Oligotrophic class), 4-10 mg/m ³ (Mesotrophic class), >10 mg/m ³ (Eutrophic class)
3	Phosphate	37-140 µg/L	0.1-90 µg/L
4	Nitrate	1556.9-2924.9 µg/L	1.0-500 µg/L
5	Nitrite	222.2-365.7 µg/L	<125 µg/L
6	Particulate Organic Carbon	6.20-13.50 mg/m ³	10-100 mg/m ³
7	Silicate	27.9-63.5 µg/L	10-5000 µg/L

The results obtained from the study for the month of January, 2022. Nitrates, Nitrite and phosphate were observed higher than prescribed standards limits of ecological parameters for Arabian Sea as monsoon upwelling causes enormous increase of these nutrient. Net Primary Productivity and Chlorophyll-a were well within prescribed standards for ecological parameters for Arabian Sea. 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.

5.0 Monitoring Performance of Sewage Treatment Plant

It is seen that the performance of STP at JNP Township is satisfactory. The treatment plant was well maintained during [January 2022] with considerable removal efficiency achieving the standards prescribed for final disposal.