MONITORING OF ENVIRONMENTAL PLAN FOR JN PORT

ENVIRONMENTAL MONITORING REPORT- SEPTEMBER 2024 EXECUTIVE SUMMARY

1.0 Ambient Air Monitoring:

Monthly average values of Air Quality parameters at various stations in JNP Area during September, 2024.

Parameters		Industrial (Port Operation) Area								Residential area	Eco Sensitive area
	NAAQS Units	IMC	NSFT-NG	SEZ	APM	BMCT	NSDT-CB	DP World	BPCL	RC	EC
PM_{10}	100 µg/m³	78.61	73.66	44.95	61.34	65.40	71.43	124.91	61.59	31.53	20.36
$PM_{2.5}$	60 µg/ m³	45.22	36.95	24.68	32.81	38.00	30.67	41.83	42.81	20.90	18.01
SO_2	80 µg/ m³	7.95	13.76	3.32	12.39	4.36	14.41	13.58	12.96	2.84	2.37
NO_2	80 µg/ m³	40.25	46.43	12.58	42.01	15.99	52.98	30.04	20.43	14.94	13.70
NH_3	400 µg/ m³	68.93	59.22	27.47	22.09	15.32	16.64	18.12	21.22	12.18	5.00
O^3	100 µg/ m³	27.20	30.70	4.67	3.55	3.82	7.03	5.93	4.15	4.29	5.72
Pb	0.5 µg/m³	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
As	6 ng/m³	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ni	20 ng/m³	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
C_6H_6	5 µg/ m³	2.14	1.94	1.16	1.50	1.50	1.50	0.72	0.29	0.54	0.27
B(a)P	1 ng/ m³	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CO	4 mg/m³	1.30	1.26	0.92	1.17	0.88	0.53	0.66	0.44	0.55	0.53
AQI		78.61	73.66	44.95	61.34	65.40	71.43	116.61	71.35	31.53	20.36

IMC - Indian Molasses Company, NSFT-NGC –Nhava Sheva Free Port Terminal- North Gate Complex, SEZ- Special Economic Zone, APM- A.P. Moller, BMCT- Bharat Mumbai Container Terminals, NSDT CB- Nhava Sheva Distribution Terminal-Coastal Berth, DP World - Dubai Ports International, BPCL- Bharat Petroleum Corporation Limited, RC-Residential Complex, EC- Elephanta Caves

1.1 Continuous Ambient Air Quality Monitoring:

Monthly average values of Air Quality parameters by Continuous Ambient Air Quality Monitoring Station at Port Operation Center (POC) - JNP area during September, 2024.

Date	PM_{10} ug/m³	$PM_{2.5}$ ug/m³	SO_2 ug/m³	NO_2 ug/m³	NH_3 ug/m³	O_3 ug/m³	C_6H_6 ug/m³	CO mg/m³	C_7H_8 ug/m³	NO ug/m³	NO_X ug/m³	AQI Remarks:
NAAQS	100	60	80	80	400	100	5	2	--	--	--	Satisfactory
Average September 2024	56.96	18.12	9.10	23.9	7.48	33.7	0.67	0.49	5.47	13.0	41.6	56.96

- 24-hr average concentration of PM_{10}, $PM_{2.5}$, SO_2, NO_2, NH_3 and other parameters were measured at 11 locations with one continuous at POC and 10 fixed Monitoring station viz. IMC, NSFT-NGC, SEZ, APM, BMCT, NSDT-CB, DP World, BPCL, JNP residential township and EC area using high volume air samplers, Fine Particulate samplers (APM 460 NL and APM550 MFC) and gaseous samplers.

- During September, 2024 overall ambient air quality of the JNP was observed at Moderate DP-World, Satisfactory at IMC, NSFT-NGC, APM, BMCT, NSDT-CB, BPCL and Good at SEZ, RC and EC location as per CPCB standards. 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 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. are helping to achieve the cleaner and green future at port.

- JN Port goes green by implementing EV trucks to reduce vehicle emissions, noise pollution and deploys E-vehicles, including in the SEZ area. E-RTGs are implemented to reduce carbon emissions and decrease the environmental impact of port operations. The port is committed to sustainable growth to reduce its 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. The work of concretizing roads at JN Port will reduce fuel consumption, traveling time, and maintenance, ensuring smooth movement of traffic on the port road.

- JN Port received rainfall of 526.50 mm during the month of September, 2024 due to a low-pressure region was strengthen monsoon winds from the Arabian Sea, causing extreme rainfall. The entire rainfall during the monsoon season is 2771.00mm. The observed lowest temperature is 26.63°C. The prominent wind direction (blowing from) was the West South West (WSW) in the port area. Average values of wind speed, temperature, relative humidity and solar radiation recorded were 8.92 Km/hr, 28.34°C, 81.97 % and 63.42 W/m^2 respectively. The maximum wind speed recorded was 13.75 Km/hr.

Solution towards the Green port:

- The use of E-Sweeper inside port promotes and enhances sustainability.
- Using truck-mounted sweepers in port reduces pollution and litter, promoting a healthier, cleaner environment.
- If you must drive, go slowly inside the port and utilize your headlights, fog lights, blinkers, and hazard lights.
- Avoid excessive idling of automobiles and ships.
- Use the public transport at public interaction places as much as possible.
- Increase of green belt initiation like Miyawaki tree plantation in JNPA will provide healthy ecosystem.
- Alternative technology, clean energy and fuel will provide a solution for zero emissions.
- Conventional RTGCs should be altered as E-RTGs counting inside the port completely.
- Green Port Initiative workshops will provide solutions to reduce carbon footprints.
- Regular servicing, tuning of vehicles and fixing of silencers will reduce the noise levels.
- Solar-powered unmanned boats to collect floating trash a solution for enhancing port cleanliness and sustainability.

2.0 Marine Water Quality

Observed concentration ranges of Marine Water for various parameters for JNP area during tidal cycle (For September, 2024*).*

Sr. No.	Parameter	Observed Range	Unit	Prescribed Limits
1	Temperature	˚C	28.1-29.4	-
2	pH	-	7.08-7.44	6.5 - 9.0
3	Salinity	ppt	26.40-28.89	-
4	Turbidity	NTU	23.9-103.4	-
5	TDS	mg/L	15847-39838	-
6	TSS	mg/L	62-209	-
7	TS	mg/L	15964-39980	-
8	DO	mg/L	3.6-4.96	3.0 mg/L(min.) or 40% of saturation
9	COD	mg/L	23.95-91.55	-
10	BOD	mg/L	0.67-2.92	5
11	Ammonia	mg/L	0.0086-0.0849	-
12	Phenol	mg/L	0.015-0.039	-
13	Oil & Grease	mg/L	0.011-0.664	10 (max.)
14	Total Plate Count	CFU/mL	196-614	-
15	Fecal Coliforms	MPN/100mL	165-638	500 (max.)

Conclusion:

The values of various parameters such as pH, Dissolved Oxygen, BOD and Oil & Grease are within the prescribed limits. 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.

2.1. Continuous Marine Water Quality Monitoring:

A Continuous Marine Water Quality Monitoring system was installed at the JNPA berth bridge location to monitor parameters such as Temperature, pH, Dissolved Oxygen, Ammonia,

Conductivity, Nitrate, Salinity, Turbidity, and Total Dissolved Solids. These parameters are found satisfactory as per prescribed limits.

3.0 Marine Ecology (Flora and Fauna):

Sl. No.	Parameter	Observed Range	Criteria
1	**Net Primary Productivity**	24.78-41.49 mgC/m^3/day	**<1500 mg C/m^3/day at surface**
2	**Chlorophyll *a***	0.9345-2.1894 mg/m^3	**<4 mg/m^3 (Oligotrophic class), 4-10 mg/m^3 (Mesotrophic class), >10 mg/m^3 (Eutrophic class)**
3	**Phosphate**	96.75-166.57 µg /L	**0.1-90 µg/L**
4	**Nitrate**	462.73-883.74 µg/L	**1.0-500 µg/L**
5	**Nitrite**	20.98-52.72 µg/L	**<125 µg/ L**
6	**Particulate Organic Carbon**	25.41-36.92 mg/m^3	**10-100 mg/m^3**
7	**Silicate**	27.26-64.22 µg/L	**10-5000 µg/L**

The results obtained from the study for the month of September, 2024. Nitrates and phosphate were observed higher than prescribed standards limit of ecological parameters for Arabian Sea disturbance in sediment leading to increase of these nutrients. 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. 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 and POC is satisfactory by overall. The treatment plant was well maintained during [September, 2024] with considerable removal efficiency achieving the standards prescribed for final disposal.