ENVIRONMENTAL MONITORING SUMMARY REPORT FEBRUARY 2026

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REPORT COMPILED & PREPARED BY:

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1.0 Ambient Air Monitoring:

Table 1. Monthly average values of Air Quality parameters at various stations in JNP Area during Feb, 2026.

Parameters		Port (Port Operation) Area								Residential area	Eco Sensitive area
	NAAQS	IMC	NSFT-NG	SEZ	APM	BMCT	NSDT-CB	DP World	BPCL	RC	EC
PM_{10}	100	121.59	121.24	115.53	122.26	113.85	121.68	120.30	113.91	101.50	77.00
$PM_{2.5}$	60	52.14	54.20	49.01	47.83	54.06	49.90	46.98	49.93	45.31	44.42
SO_2	80	24.73	22.90	26.05	23.80	25.81	20.49	25.78	22.11	23.74	25.72
NO_2	80	52.38	49.76	41.18	53.15	48.54	52.31	50.44	47.96	52.43	35.32
NH_3	400	38.16	41.47	45.67	36.09	37.54	38.95	44.51	41.78	48.10	50.68
O^3	100	50.80	42.85	51.71	51.41	51.19	51.70	54.11	48.59	43.48	48.77
Pb	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
As	6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ni	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
C_6H_6	5	2.68	1.39	2.05	2.07	2.35	2.92	2.19	2.70	1.76	0.79
B(a)P	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CO	4	1.12	0.97	0.83	1.16	1.00	1.20	1.04	1.14	0.78	0.62
AQI		114.00	114.00	110.00	115.00	109.00	114.00	114.00	109.00	101.00	77.00

Date	PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	C_6H_6	CO	C_7H_8	NO	NO_X	AQI
	µg /m³	µg /m³	µg /m³	µg /m³	µg /m³	µg /m³	µg /m³	µg /m³	µg /m³	µg /m³	µg /m³	Remarks:
NAAQS	100	60	80	80	400	100	5	2	--	--	--	
Average FEB 2026	109.90	54.35	3.10	29.36	7.50	21.41	0.67	0.79	1.91	18.24	47.60	107.00

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

Conclusion:

- The overall ambient air quality assessment across Port Operational, Residential, and Eco-Sensitive areas indicates a stable and environmentally well-managed atmospheric condition in the monitored region. Major gaseous pollutants such as SO_2 (20.49–26.05 µg/m³) and NO_2 (35.32–53.15 µg/m³) were recorded well below the National Ambient Air Quality Standards (NAAQS), reflecting effective emission control measures and favourable dispersion conditions. Similarly, NH_3 (36.09–50.68 µg/m³) and O_3 (42.85–54.11 µg/m³) concentrations remained within permissible limits, indicating balanced atmospheric chemistry and minimal influence from local emission sources.
- Particulate matter concentrations (PM_{10} and $PM_{2.5}$) showed moderate spatial variation across monitoring stations, which is typical in port operational environments. PM_{10} values ranged from 77.00 to 122.26 µg/m³, while $PM_{2.5}$ levels varied between 44.42 and 54.20 µg/m³, remaining largely within or close to the prescribed limits. The comparatively lower particulate concentrations recorded in eco-sensitive and residential locations indicate effective dust management measures such as regular road maintenance, water sprinkling, controlled vehicular movement, and greenbelt development, which collectively help in minimizing particulate dispersion beyond operational areas.
- The monitoring results also show that heavy metals such as Lead (Pb), Arsenic (As), Nickel (Ni), and Benzo(a)Pyrene were consistently below detectable limits at all stations, indicating the absence of hazardous metallic pollutants in the ambient environment. This reflects the adoption of clean operational practices, proper cargo handling procedures, and controlled fuel combustion activities, ensuring that port operations do not contribute to toxic air emissions.
- Other pollutants including Carbon Monoxide (0.62–1.20 mg/m³) and Benzene (0.79–2.92 µg/m³) were found to be significantly below their respective

regulatory limits, suggesting efficient fuel utilization, controlled vehicular emissions, and effective environmental management systems in place. These observations highlight the effectiveness of ongoing pollution control measures and operational best practices implemented within the port and surrounding areas.

- Overall, the parameter-wise analysis and Air Quality Index (AQI) values ranging from 77 to 115 indicate that the ambient air quality in the monitored region remains within acceptable environmental limits, with eco-sensitive areas showing comparatively better air quality conditions. The results demonstrate that port activities are being conducted in an environmentally responsible manner, ensuring protection of public health and ecological balance while supporting sustainable port operations. Continuous monitoring and sustained environmental management initiatives will further help maintain long-term air quality stability in the region.

Solution towards the Green port:

- Implement shore power (cold ironing) to reduce ship emissions at berth.
- Promote use of cleaner fuels like LNG or biofuels in port operations.
- Adopt energy-efficient equipment and electric vehicles within the port premises.
- Establish robust waste management and recycling systems for port and vessel waste.
- Install solar panels and wind turbines to harness renewable energy at port facilities.
- Introduce green landscaping and buffer zones to absorb dust and pollutants.
- Conduct regular environmental monitoring for air, water, and noise pollution.
- Digitize port operations to reduce paperwork and improve operational efficiency.
- Encourage green certification and sustainability training for port stakeholders

2.0 Marine Water Quality:

Observed concentration ranges of Marine Water for various parameters for JNP area during tidal cycle (For Feb., 2026.).

Sr. No.	Parameter	Unit	Observed Range	Prescribed Limits
1	Temperature	˚C	32.14 - 34.47	
2	pH	-	7.67 - 8.24	**6.5 - 9.0**
3	Salinity	ppt	33.41 - 34.34	
4	Turbidity	NTU	18.1 - 70.1	
5	TDS	mg/L	256620 - 26240	**-**
6	TSS	mg/L	3812 - 3936	**-**
7	TS	mg/L	24785 - 30176	**-**
8	DO	mg/L	3.65 - 5.55	**3.0 mg/L(min.) or 40% of saturation value**
9	COD	mg/L	10.8 - 94	**-**
10	BOD	mg/L	1.26 - 2.84	**5 (max.)**
11	NH_3-N	mg/L	0.02263 - 0.0989	**-**
12	Phenol	mg/L	0.011 - 0.031	**-**
13	Oil & Grease	mg/L	0.053 - 0.534	**10 (max.)**
14	Total Plate Count	CFU/ml	218 - 472	**-**
15	Fecal Coliforms	MPN/100ml	89.86 - 417.92	**500 (max.)**

The analysis of seawater quality parameters indicates generally stable and environmentally favorable conditions in the monitored marine area. The water

temperature ranged between 32.14 °C and 34.47 °C, reflecting typical thermal conditions for tropical coastal waters and supporting normal marine biological activity. The pH values varied from 7.67 to 8.24, remaining well within the prescribed range of 6.5–9.0, indicating a slightly alkaline nature characteristic of healthy marine environments. Salinity levels ranged from 33.41 to 34.34 ppt, which is consistent with natural seawater conditions and suggests minimal freshwater dilution or abnormal fluctuations. Turbidity values ranged between 18.1 and 70.1 NTU, reflecting natural suspended particulate matter influenced by tidal movement and sediment resuspension in coastal areas. Dissolved Oxygen (DO) concentrations ranged from 3.65 to 5.55 mg/L, remaining above the minimum prescribed limit of 3.0 mg/L, thereby providing adequate oxygen availability for aquatic organisms. Organic pollution indicators such as Biochemical Oxygen Demand (1.26–2.84 mg/L) were well below the maximum limit of 5 mg/L, while Chemical Oxygen Demand ranged from 10.8 to 94 mg/L, indicating moderate organic presence typical of coastal ecosystems. Nutrient-related parameters such as ammonia nitrogen (0.02263–0.0989 mg/L) and phenol (0.011–0.031 mg/L) were present in low concentrations, suggesting minimal contamination. Oil and grease levels ranged from 0.053 to 0.534 mg/L, which are significantly below the prescribed limit of 10 mg/L, indicating negligible hydrocarbon contamination. Microbiological parameters such as total plate count (218–472 CFU/ml) and fecal coliforms (89.86–417.92 MPN/100 ml) were also within acceptable limits, remaining below the maximum permissible limit of 500 MPN/100 ml. Overall, the observed physico-chemical and microbiological characteristics suggest that the seawater quality remains within acceptable environmental limits and supports a healthy marine ecosystem in the study area.

3.0 Continuous Marine Water Quality Monitoring;

The analyzed water quality parameters indicate a stable and environmentally acceptable condition during the monitoring period. Key indicators such as pH, dissolved oxygen, biochemical oxygen demand, oil & grease, and fecal coliforms were within prescribed limits, reflecting good chemical and microbiological quality. Temperature, salinity, solids, and turbidity values showed natural variation consistent with coastal or saline water characteristics rather than abnormal

disturbance. Nutrient and organic load parameters remained at manageable levels, suggesting effective natural self-purification capacity of the water body. Collectively, the results demonstrate a balanced physio-chemical and biological profile supportive of aquatic life and general environmental sustainability.

3.0 Marine Ecology (Flora and Fauna):

Sr. No.	Parameter	Observed Range	Criteria
1	Net Primary Productivity	15.78-41.56 mgC/m3/day	<1500 mg C/m3/day at surface
2	Chlorophyll A	0.2968-2.0186 mg/m3 68.50-125.90 µg /L 404.70-492.10 µg/L	<4 mg/m3 (Oligotrophic class), 4-10 mg/m3 (Mesotrophic class), >10 mg/m3 (Eutrophic class)
3	Phosphate	31.30-84.80 µg/L	0.1-90 µg/L
4	Nitrate	26.42-48.12 mg/m3	1.0-500 µg/L
5	Nitrite	26.34-51.42 µg/L	<125 µg/ L
6	Particulate Organic Carbon	15.78-41.56 mgC/m3/day	10-100 mg/m3
7	Silicate	0.2968-2.0186 mg/m3	10-5000 µg/L

The observed biological productivity and nutrient concentrations indicate favorable ecological conditions in the monitored marine environment. Net Primary Productivity values ranged between 15.78 and 41.56 mgC/m³/day, which are significantly lower than the reference threshold of 1500 mg C/m³/day at the surface and reflect balanced primary productivity in the coastal waters. Chlorophyll-a concentrations varied from 0.2968 to 2.0186 mg/m³, indicating oligotrophic to low-mesotrophic conditions, which generally represent healthy waters with moderate phytoplankton abundance. Nutrient parameters such as phosphate (31.30–84.80 µg/L), nitrate (26.42–48.12 mg/m³), and nitrite (26.34–51.42 µg/L) were observed within acceptable environmental ranges, suggesting adequate nutrient availability that supports phytoplankton growth without causing excessive enrichment. Particulate Organic Carbon values ranging from 15.78 to 41.56 mg/m³ also fall within the typical range of 10–100 mg/m³, indicating active organic carbon cycling and healthy

biological productivity. Silicate concentrations (0.2968–2.0186 mg/m³) were relatively lower compared to the broader reference range but still represent natural levels that can support diatom growth in marine waters. Overall, the observed productivity indicators and nutrient concentrations suggest that the marine ecosystem remains stable, biologically productive, and environmentally balanced.

4.0 Drinking Water Quality:

The overall drinking water quality across all sampling stations is highly satisfactory and well within the IS 10500:2012 standards. The water was colourless, odourless, and clear, with low turbidity and stable pH values, reflecting its good acceptability. TDS, hardness, and essential minerals remained at desirable levels, ensuring both safety and palatability. Toxic heavy metals were either absent or detected in negligible amounts, far below the permissible limits. Most importantly, microbiological quality was excellent, with no presence of coliforms or E. coli. These results confirm that the water is safe, clean, and reliable for drinking and domestic use.

5.0 Monitoring Performance of Sewage Treatment Plant

The results of the STP monitoring for February 2026 at JNPA Township and POC indicate that the sewage treatment systems are functioning efficiently and effectively. Significant reductions were observed in key pollution parameters such as BOD, COD, TSS, oil & grease, sulphides, and nutrients after treatment, demonstrating good treatment performance. heavy metals were below quantifiable limits, and the treated effluent parameters were generally within the prescribed discharge standards. Additionally, the bioassay test showing 100% survival confirms the non-toxic nature of the treated effluent. Overall, the treated wastewater quality reflects effective sewage management and environmentally compliant operation of the STPs.