



ENVIRONMENTAL MONITORING SUMMARY REPORT JULY2026

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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 July., 2026.

Parameters		Port (Port Operation) Area								Residential area	Eco Sensitive area
	NAAQS	IMC	NSFT-NG	SEZ	APM	BMCT	NSDT-CB	DP World	BPCL & JJLTPL	RC	EC
PM	100	67.89	64.44	62.22	70.67	66.44	63.56	69.11	64.78	61.33	60.50
PM	60	29.44	27.44	27.78	33.33	30.33	26.67	32.22	29.11	28.00	23.00
SO	80	17.04	15.21	15.86	16.71	16.68	17.98	19.04	19.66	16.67	14.12
NO	80	26.03	28.95	24.39	30.70	32.71	29.79	33.90	35.41	25.73	28.59
NH	400	16.31	15.89	15.18	14.69	14.97	15.41	14.73	14.90	14.99	14.65
O ³	100	35.82	38.76	33.94	40.97	42.94	39.82	44.66	45.79	34.91	38.28
Pb	0.5	BLQ(LOQ)	BLQ(LOQ)	BLQ(LOQ)	BLQ(LOQ)	BLQ(LOQ)	BLQ(LOQ)	BLQ(LOQ)	BLQ(LOQ)	BLQ(LOQ)	BLQ(LOQ)
As	6	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Ni	20	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
C ₆	5	1.32	1.38	1.39	1.34	1.35	1.37	1.48	1.37	1.26	1.35
B(a	1	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
CO	4	0.55	0.57	0.42	0.42	0.44	0.44	0.50	0.43	0.47	0.55
AQ		68.00	64.00	62.00	71.00	66.00	64.00	69.00	65.00	61.00	61.00

Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	C ₆ H ₆	CO	C ₇ H ₈	NO	NO _x	AQI
	µg /m ³	µg /m ³	µg /m ³	µg /m ³	µg /m ³	µg /m ³	µg /m ³	µg /m ³	µg /m ³	µg /m ³	µg /m ³	Remarks:
NAAQS	100	60	80	80	400	100	5	2	--	--	--	
Average July, 2026	50.80	15.28	5.25	29.90	11.25	30.73	1.30	0.51	1.92	16.94	46.83	51.00

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:

- Ambient air quality monitoring conducted across the Port Operational Areas, Residential Areas, and Eco-Sensitive Area indicated overall satisfactory and well-controlled atmospheric conditions throughout the monitoring period. PM₁₀ concentrations ranged from 60.50 to 70.67 µg/m³, while PM_{2.5} concentrations varied between 23.00 and 33.33 µg/m³, remaining well below the respective NAAQS limits of 100 and 60 µg/m³. The relatively lower particulate concentrations observed across the monitoring locations indicate effective dust suppression, good housekeeping, and controlled particulate emissions from port and associated activities.
- The gaseous pollutants also remained comfortably within the prescribed NAAQS limits. SO₂ concentrations ranged from 14.12 to 19.66 µg/m³, while NO₂ concentrations varied between 24.39 and 35.41 µg/m³. NH₃ concentrations remained very low, ranging from 14.65 to 16.31 µg/m³, and O₃ concentrations ranged from 33.94 to 45.79 µg/m³. These results indicate effective atmospheric dispersion and controlled gaseous emissions across the monitored areas.
- Trace pollutants including Lead (Pb), Arsenic (As), Nickel (Ni), and Benzo(a)Pyrene [B(a)P] were reported below their respective limits of quantification at all monitoring locations. This indicates that the monitored areas experienced minimal detectable levels of these hazardous trace contaminants during the study period and reflects effective environmental management and emission-control practices.
- Carbon Monoxide (CO) concentrations ranged from 0.42 to 0.57 mg/m³, remaining substantially below the applicable standard of 4 mg/m³. Benzene (C₆H₆) concentrations ranged from 1.26 to 1.48 µg/m³, also remaining well below the prescribed limit of 5 µg/m³. The low concentrations indicate that

combustion-related and vehicular emissions were effectively controlled and did not result in significant deterioration of ambient air quality.

- The Air Quality Index (AQI) ranged from 61 to 71, with the lowest value recorded at BPCL and EC, while the highest value was observed at APM. Overall, the monitored locations exhibited satisfactory ambient air quality, with all major pollutants remaining within the applicable NAAQS limits. The results demonstrate that existing pollution-control, dust-management, and environmental management measures are effective in maintaining good and controlled ambient air quality across the Port Operational, Residential, and Eco-Sensitive areas.

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 May., 2026.).

Sr. No.	Parameter	Unit	Observed Range	Prescribed Limits
1	Temperature	°C	24.07 – 25.66	

2	pH	-	8.08 – 8.20	6.5 - 9.0
3	Salinity	ppt	18.03 – 19.56	
4	Turbidity	NTU	18.4 – 167	
5	TDS	mg/L	25958 – 26579	-
6	TSS	mg/L	3873 – 3998	-
7	TS	mg/L	29845 - 30562	-
8	DO	mg/L	5 – 7	3.0 mg/L(min.) or 40% of saturation value
9	COD	mg/L	22 – 26	-
10	BOD	mg/L	5.1 – 5.7	5 (max.)
11	NH ₃ -N	mg/L	BLQ (LOQ:0.1)	-
12	Phenol	mg/L	200 – 320	-
13	Oil & Grease	mg/L	680 – 777	10 (max.)
14	Total Plate Count	CFU/ml	3.03 – 6.62	-
15	Fecal Coliforms	MPN/100ml	0.12 – 0.42	500 (max.)

The marine water monitoring results indicate generally favourable physicochemical and microbiological conditions, with pH ranging from 8.08–8.20, well within the prescribed range of 6.5–9.0, and temperature remaining within a relatively narrow range of 24.07–25.66°C. Salinity ranged from 18.03–19.56 ppt, while TDS and total solids were recorded at 25,958–26,579 mg/L and 29,845–30,562 mg/L, respectively, reflecting the characteristic saline nature of the monitored water. Dissolved Oxygen (DO) ranged from 5–7 mg/L, remaining comfortably above the minimum criterion of 3.0 mg/L and indicating good oxygen availability for aquatic life. COD concentrations

were comparatively low at 22–26 mg/L, while $\text{NH}_3\text{-N}$ remained below the reporting limit (LOQ 0.1 mg/L). The recorded fecal coliform values of 0.12–0.42 MPN/100 mL were substantially below the prescribed maximum of 500 MPN/100 mL, indicating favourable microbiological conditions. However, turbidity (18.4–167 NTU), TSS (3,873–3,998 mg/L), BOD (5.1–5.7 mg/L), and the reported Oil & Grease values (680–777 mg/L) require attention when compared with the stated criteria. Overall, the results demonstrate good pH, temperature, salinity, dissolved oxygen and microbiological conditions, while the parameters exceeding or approaching the specified criteria should be further investigated and monitored to assess their spatial and temporal significance.

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.

3.1 Marine Ecology (Flora and Fauna):

Sr. No.	Parameter	Criteria	Observations
1	Net primary productivity	GmC/L/hr	0.34 – 0.52
2	Chlorophyll-a	< 4 mg/m ³	0.892 – 1.305
		[Oligotrophic class] 4–10 mg/m ³	

		[Mesotrophic class]	
		>10 mg/m ³	
		Eutrophic Class	
3	Sodium (as Na)	5,000 – 30,000	2701 - 6357
4	Potassium (as K)	2,000 – 20,000 mg/kg	785 - 1843
5	Calcium (as Ca)	5,000 – 100,000mg/kg	2131- 30718
	Magnesium (as Mg)	1,000 – 30,000mg/kg	165 - 312
6	Sulphate (as SO ₄)	200 – 5,000mg/kg	269 - 729
7	Total Phosphate (as PO ₄)	100 – 2,000mg/kg	65 - 117
8	Nitrate (as NO ₃)	1 – 50mg/kg	BLQ (LOQ:0.2)
9	Nitrite (as NO ₂)	<0.1 – 5mg/kg	0.21 - 0.76
10	Silica (as SiO ₂)	300,000 – 900,000mg/kg (30– 90%)	19.1 - 28.5

The sediment and marine productivity observations indicate overall favourable ecological conditions, with Net Primary Productivity ranging from 0.34–0.52 GmC/L/hr and Chlorophyll-a concentrations of 0.892–1.305 mg/m³, placing the monitored waters within the oligotrophic class (<4 mg/m³) and indicating low algal biomass without evidence of eutrophic conditions. Sediment nutrient concentrations showed Sodium ranging from 2701–6357 mg/kg and Potassium from 785–1843

mg/kg, while Calcium ranged from 2131–30,718 mg/kg and Magnesium from 165–312 mg/kg. Sulphate concentrations of 269–729 mg/kg remained within the stated criterion, indicating normal sulphate availability. Total phosphate ranged from 65–117 mg/kg, with values generally close to the lower end of the specified range, while Nitrate was below the reporting limit (LOQ: 0.2 mg/kg), indicating low nitrate availability. Nitrite concentrations ranged from 0.21–0.76 mg/kg, remaining within the stated criterion of <0.1–5 mg/kg. Silica concentrations of 19.1–28.5 mg/kg were relatively low compared with the broad reference range. Overall, the observations indicate low nutrient enrichment, low algal biomass and predominantly oligotrophic conditions, suggesting a relatively balanced marine environment without apparent evidence of excessive nutrient accumulation or eutrophication.

4.0 Drinking Water Quality:

Summary Table for JNPA Drinking Water Locations.

Sr. No.	Parameter	Unit	Observed Range (DW1–DW22)
1	Colour	Hazen	Colourless
2	Odour	–	Odourless
3	pH	pH unit	7.01 – 7.32
4	Turbidity	NTU	0.1 – 0.8
5	Total Dissolved Solids	mg/L	8 – 36
6	Aluminium as Al	mg/L	0.0034 – 0.0082
7	NH ₃ -N	mg/L	0.0002 – 0.0026
8	Barium as Ba	mg/L	0.0133 – 0.4950
9	Calcium as Ca	mg/L	6.21 – 9.87
10	Chloride as Cl	mg/L	12 – 18
11	Copper as Cu	mg/L	0.0001 – 0.0008
12	Free Residual Chlorine	mg/L	<0.1
13	Iron as Fe	mg/L	0.0014 – 0.0083

14	Magnesium as Mg	mg/L	1.92 – 2.68
15	Manganese as Mn	mg/L	0.0001 – 0.0028
16	Oil & Grease	mg/L	0.003 – 0.009
17	Nitrate as NO ₃	mg/L	0.478 – 1.987
18	Selenium as Se	mg/L	0.0004 – 0.0005
19	Silver as Ag	mg/L	0.0001 – 0.0009
20	Sulphate as SO ₄	mg/L	3.49 – 5.01
21	Total Alkalinity as CaCO ₃	mg/L	22 – 46
22	Total Hardness as CaCO ₃	mg/L	20 – 40
23	Fluoride	mg/L	0.635 – 0.788
24	Phenolic Compounds	mg/L	0.002 – 0.004
25	Zinc as Zn	mg/L	0.0042 – 0.2794
26	Lead as Pb	mg/L	0.0015 – 0.0098
27	Mercury as Hg	mg/L	0.0001 – 0.0041
28	Molybdenum	mg/L	0.0208 – 0.0349
29	Nickel as Ni	mg/L	0.0001 – 0.0037
30	Total Arsenic as As	mg/L	0.0005 – 0.0110
31	Total Chromium as Cr	mg/L	0.0011 – 0.0090
32	Total Coliform	–	Absent
33	E-coli	–	Absent

The drinking water quality monitoring results for DW1–DW22 indicate overall good and satisfactory water quality conditions across the monitored locations. The water was colourless and odourless, with pH ranging from 7.01–7.32 and turbidity from 0.1–0.8 NTU, indicating clear and aesthetically acceptable water. Total Dissolved Solids ranged from 8–36 mg/L, while calcium and magnesium were recorded at

6.21–9.87 mg/L and 1.92–2.68 mg/L, respectively. Chloride ranged from 12–18 mg/L, sulphate from 3.49–5.01 mg/L, total alkalinity from 22–46 mg/L, and total hardness from 20–40 mg/L. Nitrate concentrations ranged from 0.478–1.987 mg/L, while fluoride ranged from 0.635–0.788 mg/L. The concentrations of trace metals were low, including aluminium 0.0034–0.0082 mg/L, copper 0.0001–0.0008 mg/L, iron 0.0014–0.0083 mg/L, manganese 0.0001–0.0028 mg/L, lead 0.0015–0.0098 mg/L, mercury 0.0001–0.0041 mg/L, nickel 0.0001–0.0037 mg/L, arsenic 0.0005–0.0110 mg/L, and chromium 0.0011–0.0090 mg/L. Oil & Grease and phenolic compounds were also very low at 0.003–0.009 mg/L and 0.002–0.004 mg/L, respectively. Importantly, Total Coliform and E. coli were absent in the monitored samples, indicating favourable microbiological quality. Overall, the observed ranges demonstrate clean, clear, low-mineral and microbiologically satisfactory drinking water conditions across the 22 monitoring locations.

5.0 Monitoring Performance of Sewage Treatment Plant

The July 2026 STP results at JNPA Township and POC indicate satisfactory treatment performance. At JNPA Township, TSS reduced from 38 to 10 mg/L, BOD from 67 to 26 mg/L, and COD from 190 to 110 mg/L. At POC, TSS reduced from 48 to 12 mg/L, while BOD and COD were 22 mg/L and 80 mg/L, respectively. Most monitored pollutants and heavy metals were BLQ or remained below the prescribed limits, and both locations achieved 100% fish survival after 96 hours. Overall, the treated sewage quality was consistent with the applicable standards and demonstrated effective STP operation.