

**COMPREHENSIVE ENVIRONMENTAL
MONITORING REPORT**

(October 2022- March 2023)

For



**NEW MANGALORE PORT AUTHORITY
Panambur, Mangalore, Karnataka**

**SIX MONTHLY ENVIRONMENTAL MONITORING COMPLIANCE REPORT FOR M/s NEW MANGALORE
PORT AUTHORITY, KARNATAKA, INDIA**

Name of Client:	M/s. NEW MANGALORE PORT AUTHORITY, KARNATAKA, INDIA
Name of Contractor:	M/s. NITYA LABORATORIES
Work Order No:	No.3/12/EMMP/CE/2020-21/TS
Nature of Job:	Monitoring of Environmental Parameters on Air, Marine, Water, STP Water, Drinking Water, Noise, DG Stack as per KSPCB/CPCB Standards for the Years 2020-21 and 2021-22
<p>1.1 Name</p> <p>1.2 Address</p> <p>1.3 Contact & Telephone Numbers</p> <p>1.4 Fax Number</p> <p>1.5 Website/Email Address</p> <p>1.6 Company/Plant Location</p> <p>1.7 Sampling Location</p> <p>1.8 Date</p> <p>1.9 Objective</p> <p>1.10 Physical Description of Monitoring</p> <p>1.11 Test Name</p> <p>1.12 Monitoring Frequency</p> <p>1.13 Sampling Method</p> <p>1.14 Analyte</p> <p>1.15 Analyte & Parameter Abbreviation</p> <p>1.16 Test Name</p> <p>1.17 Test Frequency</p> <p>1.18 Sampling Location</p> <p>1.19 Objective</p> <p>1.20 Physical Description of Monitoring</p> <p>1.21 Test Name</p>	



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1.0 INTRODUCTION

The New Mangalore Port was declared as the 9th major port on 4th May 1974 and was formally inaugurated on 11th January 1975. The provisions of major port trusts act, 1963 were extended to the new Mangalore port and a port trust board was formed with effective from 1.4.1980 over the years the port has grown from the level of handling less than a lakh tones of cargo to 42.05 million tonnes handled during the years 2017-18. The port area is of 2032 acres. The port facilities provided are to face the growing challenges and emerging needs of the 21st century. Lying south, the Indian ocean provided major sea routes connecting the middle East Africa, East Asia with Europe and the USA.

The major commodities exporting through the port are Iron ore fines, coffee, Granite, stones, fish meal and oil, iron ore pellets by containerized cargo. The major imports of the port are crude petroleum products, LPG raw cashew other liquid chemicals containerized cargo, coal, limestone, fertilizer, edible oil and cement.

1.1 Environmental Management Plan

1.1.1 Environmental Policy

NMPA is an ISO 9001:2015, 14001:2015 & ISPS Compliant Port. NMPA is prepared to protect the environment by minimizing the pollution impacts of the port activities and follows the sustainable development through environmental management performance. Prevent and control pollution and maintain eco-friendly environment. Organize environment awareness among staff, user and visitors. Team up shop floor personnel, service providers and other stake holders to work towards pollution free environment.

Being concerned towards environmental protection, NMPA has prepared an extensive environmental management plan for port operations. The field environmental monitoring studies were carried out for ambient air, noise level, stack emission, marine and drinking water quality, sludge and waste water quality, and half yearly complied data are presented here.



2.0 Air Environment

2.1 Ambient Air Quality

2.1.1 Monitoring Stations

M/s Nitya Laboratories team in consultation with Engineer In-charge of New Mangalore Port Authority fixed the frequency and number of sampling stations. Accordingly, an ambient air quality monitoring was conducted at 05 locations during the period of 1st October 2022 to 31st March 2023.

Table - 1
Location of Air Quality Monitoring Stations

Sr. No.	Location of Station	Direction w.r.t. centre of New Mangalore Port Authority
1.	US Malya Gate	Once in a Month
2.	Oil Jetty area Near I.M.C. Terminal	Once in a Month
3.	VTMS Port Control	Once in a Month
4.	Old Coastal Guard Office	Once in a Month
5.	NMPA Hospital	Once in a Month

2.1.2 Frequency and Parameters

On each sampling day, 1 set of 24 hour / 8 hour average samples was collected. The following air pollution parameters were measured by sampling during the sampling period.

1. Particulate matter (PM₁₀)
2. Particulate matter (PM_{2.5})
3. Sulphur dioxide (SO₂)
4. Oxides of nitrogen (NO_x)
5. Benzo (a) pyrene
6. Benzene
7. Carbon monoxide
8. Ammonia
9. Ozone
10. Nickel
11. Arsenic
12. Lead

2.1.3 Sampling and Analytical Procedure

A brief description of the sampling and analytical procedures followed during the ambient air quality survey is as follows:

Particulate Matter (PM₁₀)

The sampling of ambient air for evaluating PM₁₀ levels were performed with a RDS Sampler fitted with a cyclone separator. Air exiting the separator is drawn at a measured rate through pre-weighed glass fiber filter sheets of 20 cm x 25 cm sizes. The concentration of PM₁₀ were computed from the average air flow rate, sampling period and the mass of particulate matter collected over the filter surface.

Particulate Matter (PM_{2.5})

PM_{2.5} is determined as per USEPA (United State Environment Protection Agency) guidelines with the help of Fine Dust Sampler (FDS). Ambient air @ 16.67 lpm is allowed to pass through Louvered inlet and WINS Impactor assembly having a 37mm dia. filter paper. Particulate matter of size <2.5 microns is deposited on 46.2mm dia. PTFE filter. The difference of final weight and initial weight of filter paper gives the weight of particulate matter of size <2.5 microns. The concentration of PM_{2.5} is computed as the weight of dust deposited on the filter divided by volume of air sampled.



Sulphur Dioxide (SO₂)

The sampling of ambient air for evaluating the gaseous pollutants were performed with a Multigas Sampler, using the vacuum created by the FDS Sampler for drawing the air samples through the impingers. For SO₂, air was drawn at a measured and controlled rate of 400 to 500 ml/min & passed through a solution of potassium tetrachloromercurate (TCM). After sampling, the absorbing reagent was treated with dilute solutions of sulfamic acid, formaldehyde and para-rosaniline hydrochloride. The absorbance of the intensely coloured para-rosaniline methyl sulphonic acid was measured at the wavelength of 560 nm using spectrophotometer and the amount of SO₂ in the sample was computed. The ambient SO₂ concentrations were computed from the amount of SO₂ collected and the volume of air sampled.

Oxides of Nitrogen

Air was drawn at a measured and controlled rate of about 200 ml/minute through an orifice-tipped impinger containing solutions of sodium hydroxide and sodium arsenite. After completion of the sampling, an aliquot of the used absorbing solution was treated with solutions of H₂O₂, sulphanilamide and NEDA. The nitrite ion present in the impinger was calculated from the absorbance of the resulting solution measured at 540 nm using spectrophotometer. The ambient NO_x concentrations were computed from the total nitrite ion present in the impingers, overall efficiency of the impinger and the procedure, and the volume of air sampled.

Benzene

Air was drawn through a glass tube containing 5 -15 gm of silica gel (300-600 µm size) at the rate not exceeding 1.5 litre/minute for a period of 20-30 minutes to get representative volume of sample. Transfer the silica gel into a 50 ml bottle. Add 20 ml iso-propyl alcohol, shake for 2 minutes and allowed to settle for at least 5 minute. Analyze alcohol layer on gas-liquid chromatography over polypropylene glycol using flame ionization detector.

Benzo (a) Pyrene

Ambient air samples were collected for Benzo (a) pyrene in cellulose 8' x 10' membrane filters exposed for 24 h using RDS, at the average flow rate of 1.1 m³/min for particulate phase. These filter papers were extracted and analyzed by GC.

Carbon Monoxide

Rubber Bladder and Aspirators have been used to collect the 8 hourly samples for carbon monoxide. The CO levels were analyzed through Gas Chromatography with Methanizer.

Ammonia

The ambient air is collected through FDS fitted with two Midget impingers containing 10 ml absorbing solution i.e. dilute Sulphuric acid in each (one for blank) at the rate of 1.0 l/min for a period of 10-15 minutes. Ammonium sulphate solution thus formed is treated with Nessler reagent to produce yellow-brown colour complex. The Ammonia concentration is determined by spectrophotometer at 440 nm and comparing it with a standard curve.

Ozone

Air is drawn through a midget impinger containing potassium iodide in a neutral buffer in between 0.2 lpm to 2.0 lpm for a period of 30 minutes. The iodine liberated in the absorbing reagent is determined by spectrophotometer at 352 nm.

Heavy Metals (Nickel, Arsenic & Lead)

Dust sample was collected on EPM 2000 filter paper with the help of Respirable Dust Sampler & dried at 105°C for removal of moisture. Appropriate weight of sample was subjected for digestion with aqua-regia. Silica was separated by precipitation & filtration of digested sample. Filtrate was used for determination of heavy metals by using Atomic Absorption Spectrophotometer as per standard method given in APHA, 23rd edition.



2.1.4 Techniques for Measurement

The techniques used for measurement of pollutants may be summarized as under:

TABLE - 2

Measurement Techniques

Sr.No.	Parameters	Code of Practice	Sampler	Instruments used for Analysis
1.	PM ₁₀	IS: 5182(Part-IV)	RDS Sampler with Cyclone Separator	Balance, Desiccator
2.	PM _{2.5}	USEPA's Quality Assurance Guideline Documents 2.12	FDS Sampler with Wins Impactor	Balance, Deducator
3.	SO ₂	IS: 5182(Part-V)	RDS Sampler	Spectrophotometer
4.	NO _x	IS: 5182(Part-V)	RDS Sampler	Spectrophotometer
5.	Benzene	IS:5182(Part -11)	Handy Sampler	Gas Chromatograph with FID Detector
6.	Benzo (α) pyrene	-	RDS Sampler	Gas Chromatograph
7.	Carbon Monoxide	IS: 5182(Part-X)	Bladder & Aspirator	Gas Chromatograph
8.	Ammonia	APHA	RDS Sampler	Spectrophotometer
9.	Ozone	IS: 5182 (Part-XVIII)	RDS Sampler	Spectrophotometer
10.	Heavy Metal (Ni & As)	-	RDS Sampler (EPM-2000)	Atomic Absorption Spectrophotometer
11.	Heavy Metal (Pb)	IS: 5182(Part 22)	RDS Sampler (EPM-2000)	Atomic Absorption Spectrophotometer



2.1.5 Results

The observations made on air quality parameters at 05 locations have been presented in the test reports. Minimum and maximum values, arithmetic mean values of the 24 hour / 8 hour average concentrations have also been computed and presented.

Location	Parameter	Unit	Min	Max	Arithmetic Mean
1.
		
		
		
2.
		
		
		
3.
		
		
		
4.
		
		
		
5.
		
		
		



Test Report

Name of the Client: New Mangalore Port Authority
 Address of the Client: Panambur, Mangalore -575010
 Sample Description: Air Pollution
 Sample Drawn By: Nitya Laboratories

AMBIENT AIR MONITORING FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023 SUMMARY

S.No.	Locations			US Malya gate	Oil Jetty area Near I.M.C. Terminal	VTMS Port Control	Old Coastal Guard Office	NMPA Hospital	CISF ADMIN. OFFICE
	PM10	$\mu\text{g}/\text{m}^3$	Min.	61.21 (Jan. 2023)	49.85 (Jan. 2023)	50.39 (Jan. 2023)	57.45 (Jan. 2023)	62.45 (Jan. 2023)	60.68 (Dec. 2022)
			Max.	72.40 (Nov. 2022)	78.40 (Nov. 2022)	69.50 (Nov. 2022)	82.60 (Nov. 2022)	68.50 (Mar. 2023)	83.20 (Nov. 2022)
			Avg.	66.80	64.12	59.94	70.02	64.47	71.94
2	PM2.5	$\mu\text{g}/\text{m}^3$	Min.	29.91 (Oct. 2022)	26.39 (Jan. 2023)	26.48 (Dec. 2022)	29.48 (Oct. 2022)	31.28 (Feb. 2023)	30.58 (Dec. 2022)
			Max.	34.10 (Mar. 2023)	28.10 (Mar. 2023)	29.40 (Mar. 2023)	32.45 (Feb. 2023)	32.10 (Mar. 2023)	45.10 (Nov. 2022)
			Avg.	32.09	27.24	27.94	30.96	31.69	37.40
3	SO ₂	$\mu\text{g}/\text{m}^3$	Min.	20.09 (Jan. 2023)	11.80 (Mar. 2023)	13.90 (Oct. 2022)	17.50 (Dec. 2022)	18.35 (Jan. 2023)	19.23 (Dec. 2022)
			Max.	23.40 (Mar. 2023)	18.40 (Mar. 2023)	19.30 (Mar. 2023)	23.40 (Nov. 2022)	25.40 (Mar. 2023)	25.20 (Nov. 2022)
			Avg.	21.74	15.25	16.66	20.45	21.87	22.12
4	NO ₂	$\mu\text{g}/\text{m}^3$	Min.	30.10 (Jan. 2023)	21.40 (Dec. 2022)	19.40 (Dec. 2022)	20.6 (Jan. 2023)	25.10 (Jan. 2023)	26.30 (Dec. 2022)
			Max.	36.60 (Mar. 2023)	28.20 (Nov. 2022)	25.45 (Jan. 2023)	38.50 (Nov. 2022)	28.40 (Mar. 2023)	32.47 (Nov. 2022)
			Avg.	33.60	24.80	22.05	30.05	26.75	29.38
5	CO	mg/m^3	Min.	0.91 (Oct. 2022)	0.48 (Dec. 2022)	0.52 (Dec. 2022)	0.56 (Dec. 2022)	0.82 (Feb. 2023)	0.24 (Oct. 2022)
			Max.	1.04 (Jan. 2023)	1.16 (Nov. 2022)	1.13 (Nov. 2022)	1.18 (Nov. 2022)	0.94 (Mar. 2023)	0.75 (Dec. 2022)
			Avg.	0.975	0.82	0.86	0.87	0.88	0.54
6	NH ₃	$\mu\text{g}/\text{m}^3$	Min.	30.90 (Jan. 2023)	22.30 (Dec. 2022)	24.38 (Dec. 2022)	25.49 (Dec. 2022)	29.30 (Feb. 2023)	28.38 (Dec. 2022)
			Max.	34.50 (Nov. 2022)	41.20 (Nov. 2022)	54.30 (Nov. 2022)	49.50 (Nov. 2022)	30.10 (Mar. 2023)	44.60 (Nov. 2022)
			Avg.	32.20	31.75	39.34	37.49	29.72	36.49
7	O ₃	$\mu\text{g}/\text{m}^3$	Min.	21.80 (Oct. 2022)	21.25 (Dec. 2022)	20.50 (Dec. 2022)	21.10 (Oct. 2022)	25.10 (Jan. 2023)	23.10 (Dec. 2022)
			Max.	27.30 (Mar. 2023)	30.40 (Nov. 2022)	25.30 (Mar. 2023)	23.84 (Feb. 2023)	26.50 (Mar. 2023)	27.75 (Nov. 2022)
			Avg.	24.55	25.77	22.90	22.47	25.8	25.42
8	Pb	$\mu\text{g}/\text{m}^3$		ND	ND	ND	ND	ND	ND
9	CrH6			ND	ND	ND	ND	ND	ND
10	BAP			ND	ND	ND	ND	ND	ND
11	As	mg/m^3		ND	ND	ND	ND	ND	ND
12	Ni			ND	ND	ND	ND	ND	ND



Test result of New Mangalore cold Terminal of March Month

Test Parameters/ Date of Sampling	New Mangalore Cold Terminal	NAAQM Standards	Test Method
	28/03/2023		
Particulate Matter (PM2.5) $\mu\text{g}/\text{m}^3$	33.50	60	40CFR Appendix L Part 53 CPCB Guidelines
Particulate Matter (PM10) $\mu\text{g}/\text{m}^3$	62.40	100	IS:5182 (P-23)
Sulphur Dioxide (as SO ₂) $\mu\text{g}/\text{m}^3$	19.50	80	IS:5182 (P-2)
Nitrogen Dioxide (as NO ₂) $\mu\text{g}/\text{m}^3$	23.50	100	IS:5182 (P-6)
Ozone(as O ₃) $\mu\text{g}/\text{m}^3$	24.60	100	IS:5182 (P-9)
Lead (as Pb ²⁺) $\mu\text{g}/\text{m}^3$	ND	1	NL/SOP/AAQ-11
Carbon Monoxide (as CO) mg/m^3	0.83	2	IS:5182 (P-10)
Ammonia (as NH ₃) $\mu\text{g}/\text{m}^3$	27.80	400	Method of Air Sampling & Analysis CPCB Guidelines
Nickel (as Ni ²⁺) ng/m^3	ND	20	NL/SOP/AAQ-13
Arsenic (as As ³⁺) ng/m^3	ND	6	NL/SOP/AAQ-12
Benzo (a) pyrene (as BAP ⁺) ng/m^3	ND	1	IS:5182 (P-12)
Benzene (C ₆ H ₆) $\mu\text{g}/\text{m}^3$	ND	5	IS:5182 (P-11)



2.1.6 Air Quality Standards

MINISTRY OF ENVIRONMENT AND FORESTS

NOTIFICATION

New Delhi, the 16th November, 2009

G.S.R. 826(E) – In exercise of the power conferred by section 6 and section 25 of the Environment (Protection) Act 1986, the Central Government hereby makes the following rules further to amend the Environment (Protection) Rules, 1986 namely:

1. (i) These rules may be called the Environment (Protection) Seventh Amendment Rules, 2009
(ii) They shall come into force on the date of their publication in the official gazette.
2. In the Environment (Protection) Rules, 1986 hereinafter referred to as the said rules, in rule 3, in sub-rule (3B), for the words, brackets, figures and letters, "in columns (3) to (5) of Schedule VII", the words, brackets, figures and letters "in columns (4) and (5) of Schedule-VII" shall be substituted.
3. For Schedule VII to the said rules and entries relating thereto, the following schedule and entries shall be substituted namely:

TABLE - 8

ENVIRONMENT (PROTECTION) SEVENTH AMENDMENT RULES, 2009

NATIONAL AMBIENT AIR QUALITY STANDARDS

*[SCHEDULE VII]

[See Rule 3 (3B)]

NATIONAL AMBIENT AIR QUALITY STANDARDS

Sr. No.	Pollutants	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
			Industrial, Residential, Rural & Other Areas	Ecologically Sensitive Area (notified by Central Govt.)	
(1)	(2)	(3)	(4)	(5)	(6)
1.	Sulphur Dioxide (SO ₂), µg/m ³	Annual*	50	20	-Improved West & Gaeke
		24-hours**	80	80	-Ultraviolet Fluorescence
2.	Nitrogen Dioxide (NO ₂), µg/m ³	Annual*	40	30	-Modified Jacob & Hochheiser (Na-Arsenite)
		24-hours**	80	80	-Chemiluminescence
3.	Particulate Matter (Size less than 10µm) or PM ₁₀ , µg/m ³	Annual*	60	60	-Gravimetric
		24-hours**	100	100	-TOEM
4.	Particulate Matter (Size less than 2.5µm) or PM _{2.5} , µg/m ³	Annual*	40	40	-Beta attenuation
		24-hours**	60	60	-TOEM
5.	Ozone (O ₃), µg/m ³	8-hours*	100	100	-UV Photometric
					-Gravimetric



		1-hour**	180	180	-Chemical Method
6.	Lead (Pb), $\mu\text{g}/\text{m}^3$	Annual*	0.50	0.50	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
		24-hours**	1.0	1.0	-ED-XRF using Teflon filter
7.	Carbon Monoxide (CO), mg/m^3	8-hours*	02	02	-NDIR Spectroscopy
		1-hour**	04	04	
8.	Ammonia (NH_3), $\mu\text{g}/\text{m}^3$	Annual*	100	100	-Chemiluminescence
		24-hours**	400	400	-Indophenol Blue Method
9.	Benzene (C_6H_6), $\mu\text{g}/\text{m}^3$	Annual*	05	05	- Gas Chromatography based continuous Analyzer -Adsorption and Desorption followed by GC Analysis
10.	Benzo(a)Pyrene (BAP)- particulate phase only, ng/m^3	Annual*	01	01	-Solvent Extraction followed by HPLC/GC Analysis
11.	Arsenic (As), ng/m^3	Annual*	06	06	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
12.	Nickel (Ni), ng/m^3	Annual*	20	20	-AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper

* Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24-hourly at uniform intervals.

** 24-hourly or 08-hourly or 01-hourly monitored values, as applicable, shall be complied with 95% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Note: Whenever and wherever monitoring result on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigation.



2.1.7 Results & Discussion on Observations

2.1.7.1 Particulate Matter (PM₁₀)

During the study period, the PM₁₀ concentrations were observed in the range of 49.85 to 83.20 $\mu\text{g}/\text{m}^3$, with the average value ranged between of 59.94 to 71.94 $\mu\text{g}/\text{m}^3$. It can be observed that the average value is within the limits specified in the ambient air quality standards. It is, therefore, concluded that PM₁₀ concentrations in the area are well within standards and the atmosphere has adequate receptive capacity.

2.1.7.2 Particulate Matter (PM_{2.5})

During the study period, the PM_{2.5} concentrations were observed in the range of 26.39 to 45.10 $\mu\text{g}/\text{m}^3$, with the average value ranged between of 27.24 to 37.40 $\mu\text{g}/\text{m}^3$. It can be observed that the average value is within the limits specified in the ambient air quality standards. It is, therefore, concluded that PM_{2.5} concentrations in the area are well within standards and the atmosphere has adequate receptive capacity.

2.1.7.3 Sulphur Dioxide (SO₂)

During the study period, the SO₂ concentrations were observed in the range of 11.80 to 25.40 $\mu\text{g}/\text{m}^3$, with the average value ranged between of 15.25 to 22.12 $\mu\text{g}/\text{m}^3$. It can be observed that the average value is within the limits specified in the ambient air quality standards. It is, therefore, concluded that SO₂ concentrations in the area are well within standards and the atmosphere has adequate receptive capacity.

2.1.7.4 Oxides of Nitrogen (NO_x)

During the study period, the NO_x concentrations were observed in the range of 19.40 to 36.50 $\mu\text{g}/\text{m}^3$, with the average value ranged between of 22.05 to 33.60 $\mu\text{g}/\text{m}^3$. It can be observed that the average value is within the limits specified in the ambient air quality standards. It is, therefore, concluded that NO_x concentrations in the area are well within standards and the atmosphere has adequate receptive capacity.

2.1.7.5 Benzene (C₆H₆)

During the study period, the Benzene concentrations were found below detection level. The concentration of Benzene cannot be compared with National Ambient Air Quality Standard as there is no standard for 24-hrs average in NAAQS.

2.1.7.6 Benzo (a) pyrene

During the study period, the Benzo (a) pyrene concentrations were found below detection level.

2.1.7.7 Carbon monoxide (CO)

During the study period, the CO concentrations were observed in the range of 0.24 to 1.18 mg/m^3 , with the average value ranged between of 0.54 to 0.97 mg/m^3 . Thus, the average values of CO concentrations are within the limits specified in the ambient air quality. It is, therefore, concluded that CO concentrations in the area are well within standards and the atmosphere has adequate receptive capacity.

2.1.7.8 Ammonia (NH₃)

During the study period, the ammonia concentrations were observed in the range of 22.30 to 54.30 $\mu\text{g}/\text{m}^3$, with the average value ranged between of 29.72 to 39.34 $\mu\text{g}/\text{m}^3$. Thus, the average values of ammonia concentrations are within the limits specified in the ambient air quality. It is, therefore, concluded that ammonia concentrations in the area are well within standards and the atmosphere has adequate receptive capacity.

2.1.7.9 Ozone (O₃)

During the study period, the O₃ concentrations were observed in the range of 20.50 to 30.40 $\mu\text{g}/\text{m}^3$, with the average value ranged between of 22.47 to 25.80 $\mu\text{g}/\text{m}^3$. Thus, the average values of O₃ concentrations are within the limits specified in the ambient air quality. It is, therefore, concluded that O₃ concentrations in the area are well within standards and the atmosphere has adequate receptive capacity.



2.1.7.10 Nickel (Ni)

During the study period, the Nickel concentrations were found below detection level. The concentration of nickel cannot be compared with National Ambient Air Quality Standard as there is no standard for 24-hrs average in NAAQS.

2.1.7.11 Arsenic (As)

During the study period, the Arsenic concentrations were found below detection level. The concentration of arsenic cannot be compared with National Ambient Air Quality Standard as there is no standard for 24-hrs average in NAAQS.

2.1.7.12 Lead (Pb)

During the study period, the Lead concentrations were found below detection level.



Table with 2 columns: S.No. and Description. The content is mostly illegible due to blurriness.

NOISE MONITORING

Monitoring was carried out by Noise Monitoring & Control Laboratory, Faridabad, Haryana, India. The results are given below.



3.0 NOISE MONITORING

3.1 Monitoring Stations

The Nitya Laboratories team in consultation with the Engineer In-charge of New Mangalore Port Authority, Paradip fixed the frequency and number of sampling stations. Accordingly, a Noise monitoring was conducted at 06 locations during the period from October 2022 to March 2023.

Table - 3
Location of Noise Monitoring Stations

Sr. No.	Location of Station	Frequency
1.	Malya Gate (Main Gate)	Once in a Month
2.	Wharf Berth (Inside)	Once in a Month
3.	Administrative Office Building	Once in a Month
4.	J.N.C. Hall in the campus	Once in a Month
5.	Wharf Canteen	Once in a Month
6.	Container Yard	Once in a Month

3.2 Results

The observations made on Noise Monitoring at 06 locations have been presented through Table-2. Minimum and maximum values and arithmetic mean values of the 24-hour average concentrations have also been computed and presented.

Sr. No.	Location of Station	Noise Level (dB)			Remarks
		Min	Max	Arithmetic Mean	
1.	Malya Gate (Main Gate)	55	75	65	
2.	Wharf Berth (Inside)	55	75	65	
3.	Administrative Office Building	55	75	65	
4.	J.N.C. Hall in the campus	55	75	65	
5.	Wharf Canteen	55	75	65	
6.	Container Yard	55	75	65	



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Noise Monitoring

Sample Drawn By: Nitya Laboratories

Ambient Noise Monitoring for Six Months October 2022 to March 2023 Summary

Sr. No.	Location	Noise Level in dB(A)							
		Day Time				Night Time			
		Min.	Max.	Average	CPCB Limit	Min.	Max.	Average	CPCB Limit
1	Malya Gate (Main Gate)	70 (Oct. 2022)	72.5 (March 2023)	71.26	Industrial Area Day Time Avg. 75 dB(A)	64 (Oct. 2022)	65.4 (Nov. 2022)	64.7	Industrial Area Day Time Avg. 70 dB(A)
2	Wharf Berth (inside)	68.1 (Nov 2022)	71.8 (March 2023)	69.86		59.8 (Feb 2023)	61.2 (March 2023)	60.66	
3	Administrative Office Building	68.7 (Oct. 2022)	70.5 (March 2023)	69.61		61.2 (Oct. 2022)	62.8 (March 2023)	62.18	
4	J.N.C. Hall in the campus	71.2 (Nov. 2022)	72.4 (Oct. 2022)	71.76		62.1 (Nov. 2022)	63.8 (Oct. 2022)	62.80	
5	Wharf Canteen	66.4 (Feb. 2023)	71.5 (Oct. 2022)	68.88		64.1 (Jan. 2023)	67.6 (Mar. 2023)	66.88	
6	Container Yard	72.3 (Jan. 2023)	74.3 (Oct. 2022)	73.08		64.8 (Feb. 2023)	67.5 (Nov. 2022)	66.35	



3.3 Sampling and Analytical Procedure

The ambient Noise Level in four cardinal directions were carried out using anLutron sound level meter with windscreen during the daytime as well as night-time. Noise measurements were made at 1.5 meter above the ground level and about 3 m away from the walls, buildings or other sound reflecting sources. The measurements were carried out in such a way that 1 meter away from the sources and 1 meter away from the edge of the roads. In order to reduce the disturbance from standing waves, the noise level measured were averaged over +0.5m each of at less three positions. The mean values were taken for reporting.

DRINKING WATER QUALITY



DRINKING WATER QUALITY MONITORING



4.0 Drinking Water Sampling

4.1 Sampling Location

The Nitya Laboratories team in consultation with the Engineer In-charge of New Mangalore Port Authority, Paradip fixed the frequency and number of sampling stations. Accordingly, an Water sampling was conducted at 19 locations during the period from October 2022 to March 2023.

Table - 4
Location of Drinking Water Sampling Stations

Sr. No.	Location of Station	Frequency
1.	Administration Building as DW1	Once in a Month
2.	NMPA School as DW2	Once in a Month
3.	NMPA Canteen as DW3	Once in a Month
4.	Hospital as DW4	Once in a Month
5.	NMPA Any Water Inlet Inside Wharf as DW5	Once in a Month
6.	Wharf Canteen (Inside the Port Area) as DW6	Once in a Month
7.	Traffic Building (Inside the Port Area) as DW7	Once in a Month
8.	Berth No.14 (Inside the Port Area) as DW8	Once in a Month
9.	Berth No.9 (Inside The Port Area) as DW9	Once in a Month
10.	NMPA Guest House as DW10	Once in a Month
11.	Marshalling Yard as DW11	Once in a Month
12.	Fifth Avenue Open Well as S1	Once in a Month
13.	RCHW Colony Open Well as S2	Once in a Month
14.	RCHW Colony New Open Well as S3	Once in a Month
15.	Sump Tank (Pump House) as S4	Once in a Month
16.	New UGR Open Well as S5	Once in a Month
17.	Timber Yard as S6	Once in a Month
18.	Thimmappayya Well as S7	Once in a Month
19.	MCC Water at New UGR as S8	Once in a Month

4.2 Results

The observations made on drinking water sampling at 19 locations have been presented through Table-2. Minimum and maximum values and arithmetic mean values of the 24-hour average concentrations have also been computed and presented.

4.3 Methodology

The samples for drinking water quality characterization were collected and analysed as per the procedures specified in "Standard Method for the Examination of Water & Wastewater published by "American Public Health Association" (APHA: 23rd edition) and IS 3025. All the parameters except Heavy metals and Bacteriological were analysed at the site i.e., at Panambur. Samples of heavy metals and bacteriological parameters have been sent to our Laboratory. Samples for chemical analysis were collected in polyethylene containers. Samples collected for metal content were acidified with 1 ml. HNO₃.



4.4 Results & Discussion on Observations

4.4.1 Administration Building as DW1

During the study period, at this location, pH was found between 6.62 to 7.45. Total Hardness was found between 16 to 80 mg/l. Chlorides and Sulphates were found between 12 to 44.98 mg/l and 0.86 to 8.09 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.02 to 0.09 mg/l and 0.05 to 0.10 mg/l respectively. Standard Plate Count is between 52 to 66 cfu/ml and Coliforms were absent. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.2 NMPA School as DW2

During the study period, at this location, pH was found between 6.88 to 7.62. Total Hardness was found between 26 to 95 mg/l. Chlorides and Sulphates were found between 20 to 35.99 mg/l and 6.42 to 10.5 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.03 to 0.076 mg/l and 0.056 to 0.24 mg/l respectively. Standard Plate Count is between 54 to 60 cfu/ml and Coliforms were absent. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.3 NMPA Canteen as DW3

During the study period, at this location, pH was found between 6.70 to 7.50. Total Hardness was found between 14 to 90 mg/l. Chlorides and Sulphates were found between 10 to 34.98 mg/l and 6.40 to 9.4 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.05 to 0.081 mg/l and 0.029 to 0.108 mg/l respectively. Standard Plate Count is between 50 to 62 cfu/ml and Coliforms were absent. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.4 Hospital as DW4

During the study period, at this location, pH was found between 6.67 to 7.70. Total Hardness and Total Dissolved Solids were found between 30 to 80 mg/l and 70 to 200. Chlorides and Sulphates were found between 14 to 31.46 mg/l and 7.0 to 12.32 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.056 to 0.09 mg/l and 0.024 to 0.070 mg/l respectively. Standard Plate Count is between 49 to 64 cfu/ml and Coliforms were absent. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.5 NMPA any Water Inlet Inside Wharf as DW5

During the study period, at this location, pH was found between 6.54 to 7.90. Total Hardness and Total Dissolved Solids were found between 14 to 90 mg/l and 80 to 244. Chlorides and Sulphates were found between 10.43 to 26.77 mg/l and 7.6 to 12.58 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.032 to 0.085 mg/l and 0.043 to 0.14 mg/l respectively. Standard Plate Count is between 58 to 68 cfu/ml and Coliforms were absent. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.6 Wharf Canteen (Inside the Port Area) as DW6

During the study period, at this location, pH was found between 6.42 to 7.30. Total Hardness and Total Dissolved Solids were found between 12 to 110 mg/l and 36 to 168. Chlorides and Sulphates were found between 10.91 to 40 mg/l and 3.27 to 20.0 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.041 to 0.096 mg/l and 0.07 to 0.095 mg/l respectively. Standard Plate Count is between 46 to 56 cfu/ml and Coliforms were absent. All these values were found well within the IS: 10500-2012 norms prescribed.



4.4.7 Traffic Building (Inside the Port Area) as DW7

During the study period, at this location, pH was found between 6.70 to 7.30. Total Hardness and Total Dissolved Solids were found between 22 to 100 mg/l and 76 to 150. Chlorides and Sulphates were found between 19.99 to 31.73 mg/l and 4.40 to 12.80 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.042 to 0.20 mg/l and 0.05 to 0.10 mg/l respectively. Standard Plate Count is between 51 to 69 cfu/ml and Coliforms were absent. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.8 Berth No.14 (Inside the Port Area) as DW8

During the study period, at this location, pH was found between 6.41 to 7.45. Total Hardness and Total Dissolved Solids were found between 24 to 128 mg/l and 150 to 410. Chlorides and Sulphates were found between 17.99 to 95.18 mg/l and 15.34 to 332.58 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.014 to 0.21 mg/l and 0.009 to 0.098 mg/l respectively. Standard Plate Count is between 50 to 58 cfu/ml and Coliforms were absent. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.9 Berth No.9 (Inside the Port Area) as DW9

During the study period, at this location, pH was found between 6.48 to 7.30. Total Hardness and Total Dissolved Solids were found between 106 to 208 mg/l and 280 to 390. Chlorides and Sulphates were found between 40.32 to 111.96 mg/l and 20.24 to 35.20 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.072 to 0.22 mg/l and 0.04 to 0.81 mg/l respectively. Standard Plate Count is between 43 to 54 cfu/ml and Coliforms were absent. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.10 NMPA Guest House as DW10

During the study period, at this location, pH was found between 6.24 to 7.90. Total Hardness and Total Dissolved Solids were found between 16 to 110 mg/l and 96 to 164. Chlorides and Sulphates were found between 5.69 to 30 mg/l and 6.19 to 14.54 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.024 to 0.074 mg/l and 0.038 to 0.078 mg/l respectively. Standard Plate Count is between 48 to 57 cfu/ml and Coliforms were absent. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.11 Marshalling Yard as DW11

During the study period, at this location, pH was found between 6.48 to 7.80. Total Hardness and Total Dissolved Solids were found between 24 to 105 mg/l and 86 to 170. Chlorides and Sulphates were found between 18 to 35.69 mg/l and 5.29 to 18.44 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.015 to 0.105 mg/l and 0.043 to 0.081 mg/l respectively. Standard Plate Count is between 46 to 57 cfu/ml and Coliforms were absent. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.12 Wharf Open well (Inside Port Area)

During the study period, at this location, pH was found between 7.05 to 7.55. Total Hardness and Total Dissolved Solids were found between 96 to 354 mg/l and 354 to 470. Chlorides and Sulphates were found between 48 to 68.32 mg/l and 8.15 to 28.40 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.08 to 0.25 mg/l and 0.10 to 0.158 mg/l respectively. Standard Plate Count is between 320 to 1582 cfu/ml and Coliforms were absent. All these values were found well within the IS: 10500-2012 norms prescribed.



4.4.13 Fifth Avenue Open Well as S1

During the study period, at this location, pH was found between 6.62 to 6.90. Total Hardness and Total Dissolved Solids were found between 64 to 115 mg/l and 146 to 501. Chlorides and Sulphates were found between 20 to 45.98 mg/l and 6.86 to 11.42 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.02 to 0.20 mg/l and 0.05 to 0.25 mg/l respectively. Standard Plate Count is between 48 to 1670 cfu/ml and Coliforms is between 40 to 68 MPN/100ml. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.14 RCHW Colony Open Well as S2

During the study period, at this location, pH was found between 6.54 to 6.95. Total Hardness and Total Dissolved Solids were found between 44 to 120 mg/l and 136.5 to 375. Chlorides and Sulphates were found between 18.20 to 35.90 mg/l and 7.89 to 13.45 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.03 to 0.096 mg/l and 0.04 to 0.09 mg/l respectively. Standard Plate Count is between 742 to 1692 cfu/ml and Coliforms is between 39 to 58 MPN/100ml. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.15 RCHW Colony New Open Well as S3

During the study period, at this location, pH was found between 6.60 to 6.89. Total Hardness and Total Dissolved Solids were found between 54 to 106 mg/l and 127 to 360. Chlorides and Sulphates were found between 16.3 to 28.14 mg/l and 7.02 to 12.13 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.07 to 0.21 mg/l and 0.10 to 0.21 mg/l respectively. Standard Plate Count is between 703 to 1595 cfu/ml and Coliform is between 40 to 58 MPN/100ml. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.16 Sump Tank (Pump House) as S4

During the study period, at this location, pH was found between 6.73 to 7.05. Total Hardness and Total Dissolved Solids were found between 56 to 120 mg/l and 117 to 420. Chlorides and Sulphates were found between 14 to 32.12 mg/l and 7 to 15 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.01 to 0.22 mg/l and 0.10 to 0.40 mg/l respectively. Standard Plate Count is between 743 to 1604 cfu/ml and Coliforms is between 32 to 63 MPN/100ml. All these values were found well within the IS: 10500-2012 norms prescribed.

4.3.17 New UGR Open Well as S5

During the study period, at this location, pH was found between 6.59 to 7.10. Total Hardness and Total Dissolved Solids were found between 54 to 81 mg/l and 123 to 305. Chlorides and Sulphates were found between 14 to 36.88 mg/l and 6.50 to 13.04 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.09 to 0.25 mg/l and 0.10 to 0.15 mg/l respectively. Standard Plate Count is between 642 to 1649 cfu/ml and Coliforms is between 25 to 49 MPN/100ml. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.18 Timber Yard as S6

During the study period, at this location, pH was found between 6.90 to 7.05. Total Hardness and Total Dissolved Solids were found between 60 to 100 mg/l and 152 to 350. Chlorides and Sulphates were found between 23.78 to 42.98 mg/l and 6.80 to 21.95 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.07 to 0.22 mg/l and 0.11 to 0.20 mg/l respectively. Standard Plate Count is between 763 to 1603 cfu/ml and Coliforms is between 33 to 58 MPN/100ml. All these values were found well within the IS: 10500-2012 norms prescribed.

4.4.19 Thimmappayya Well as S7

During the study period, at this location, pH was found between 6.93 to 7.15. Total Hardness and Total Dissolved Solids were found between 16 to 101 mg/l and 132 to 190. Chlorides and Sulphates were found between 17.85 to 26.45 mg/l and 6.35 to 15 mg/l respectively. Iron is found ND. The Ammonical Nitrogen and Phosphates are found between 0.06 to



0.25 mg/l and 0.09 to 0.325mg/l respectively. Standard Plate Count is between 403 to 1672 cfu/ml and Coliforms is between 12 to 70 MPN/100ml. All these values were found well within the IS: 10500-2012 norms prescribed

(The following table content is extremely faint and largely illegible due to low contrast and bleed-through from the reverse side of the page. It appears to be a data table with multiple columns and rows.)



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023 SUMMARY

Sr. No.	Parameters	Unit	Test Results Administration Building as DW1			Requirement IS:10500	Protocol
			Minimum	Maximum	Average		
1	pH	-	6.52 (Jan. 2023)	7.45 (Dec. 2022)	7.03	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	µs/cm	102.3 (Jan. 2023)	290 (Nov. 2022)	181.15	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	70 (March. 2023)	150 (Dec. 2022)	116.40	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	16 (Jan. 2023)	60 (Dec. 2022)	49.90	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	12 (Feb. 2023)	44.96 (Oct. 2022)	30.69	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	0.86 (Oct. 2022)	8.09 (Mar. 2023)	4.89	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.02 (Feb. 2023)	0.09 (Oct. 2022)	0.065	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.05 (Dec. 2022)	0.10 (Feb. 2023)	0.075	-	IS:3025 (P-31)
13	Standard Plate Count	Col/ml	52 (Jan. 2023)	66 (Nov. 2022)	59.10	-	IS:1622
14	Total Coliform	MPN/100 ml	Absent	Absent	Absent	Absent	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No	Parameters	Unit	Test Results NMPA School as DW2			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.68 (Jan. 2023)	7.82 (Dec. 2022)	7.15	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	146 (Mar. 2023)	280 (Dec. 2022)	216	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	110.5 (Feb. 2023)	270 (Dec. 2022)	195.5	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	26 (Jan. 2023)	95 (Dec. 2022)	60.50	200	IS:3025 (P-21)
8	Chloride as Cl	mg/l	20 (Feb. 2023)	35.99 (Dec. 2022)	27.99	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	8.42 (Nov. 2022)	10.5 (Feb. 2023)	8.46	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.03 (Feb. 2023)	0.075 (Oct. 2022)	0.055	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ³⁻	mg/l	0.056 (Nov. 2022)	0.24 (Feb. 2023)	0.148	-	IS:3025 (P-31)
13	Standard Plate Count	Clu/ml	54 (Mar. 2023)	60 (Dec. 2022)	57	-	IS:1622
14	Total Coliform	MPN/100 ml	Absent	Absent	Absent	Absent	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No	Parameters	Unit	Test Results NMPA Canteen as DW3			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.70 (Feb. 2023)	7.50 (Dec. 2022)	7.10	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	102.90 (Jan. 2023)	220 (Dec. 2022)	164.45	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	78 (Feb. 2023)	290 (Dec. 2022)	188	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	14 (Jan. 2023)	60 (Dec. 2022)	62	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	10 (Feb. 2023)	34.98 (Oct. 2022)	22.49	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	6.40 (Dec. 2022)	8.40 (Mar. 2023)	7.90	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.050 (Dec. 2022)	0.081 (Oct. 2022)	0.065	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.029 (Feb. 2023)	0.106 (Mar. 2023)	0.068	-	IS:3025 (P-31)
13	Standard Plate Count	CFU/ml	50 (Oct. 2022)	62 (Jan. 2023)	56	-	IS:1622
14	Total Coliform	MPN/100 ml	Absent	Absent	Absent	Absent	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Test Results Hospital as DW4			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.67 (Jan. 2023)	7.70 (Dec. 2022)	7.18	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	108 (Feb. 2023)	210 (Dec. 2022)	158.6	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	70 (Feb. 2023)	200 (Dec. 2022)	138.4	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	30 (Jan. 2023)	80 (Dec. 2022)	55	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	14 (Mar. 2023)	32.46 (Dec. 2022)	23.25	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	7.00 (Jan. 2023)	12.32 (Oct. 2022)	9.66	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.056 (Feb. 2023)	0.09 (Dec. 2022)	0.078	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.024 (Dec. 2022)	0.070 (Mar. 2023)	0.047	-	IS:3025 (P-31)
13	Standard Plate Count	Cfu/ml	48 (Oct. 2022)	64 (Jan. 2023)	56.5	-	IS:1622
14	Total Coliform	MPN/100 ml	Absent	Absent	Absent	Absent	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Test Results			Requirement IS:10500	Protocol
			NMPA Any Water Inlet Inside Wharf as DW5			Desirable	
			Minimum	Maximum	Average		
1	pH	-	6.54 (Jan. 2023)	7.90 (Dec. 2022)	7.22	6.5-8.5	IS:3025 (P-11)
2	Color	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	90.5 (Oct. 2022)	196 (Feb. 2023)	143.4	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	60 (Mar. 2023)	244 (Jan. 2023)	164.40	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	14 (Oct. 2022)	90 (Dec. 2022)	52	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	10.43 (Dec. 2022)	26.77 (Jan. 2023)	18.60	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	7.6 (Oct. 2022)	12.58 (Jan. 2023)	10.09	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.032 (Nov. 2022)	0.065 (Oct. 2022)	0.17	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.043 (Jan. 2023)	0.14 (Oct. 2022)	0.091	-	IS:3025 (P-31)
13	Standard Plate Count	CFU/ml	58 (Feb. 2023)	58 (Jan. 2023)	63	-	IS:1622
14	Total Coliform	MPN/100 ml	Absent	Absent	Absent	Absent	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Test Results Wharf Canteen (Inside the Port Area) as DWG			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.42 (Jan. 2023)	7.30 (Dec. 2022)	6.95	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	29.3 (Jan. 2023)	260 (Feb. 2023)	154.65	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	36 (Oct. 2022)	168 (Feb. 2023)	105	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	12 (Jan. 2023)	110 (Dec. 2022)	61.8	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	10.91 (Jan. 2023)	40 (Feb. 2023)	25.45	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	0.96 (Feb. 2022)	43.41 (Oct. 2021)	11.55	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.041 (Nov. 2022)	0.096 (Oct. 2022)	0.068	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.07 (Oct. 2022)	0.095 (Feb. 2023)	0.082	-	IS:3025 (P-31)
13	Standard Plate Count	CFU/ml	45 (Mar. 2022)	56 (Jan. 2023)	51.5	-	IS:1622
14	Total Coliform	MPN/100 ml	Absent	Absent	Absent	Absent	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Test Results Traffic Building (Inside The Port Area) as DW7			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.70 (Jan. 2023)	7.30 (Dec. 2022)	7	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	131.2 (Oct. 2022)	250 (Feb. 2023)	190.6	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	78 (Oct. 2022)	150 (Feb. 2023)	115	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	22 (Oct. 2022)	100 (Feb. 2023)	61	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	16.99 (Oct. 2022)	31.73 (Jan. 2023)	25.86	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	4.40 (Oct. 2022)	12.80 (Mar. 2023)	8.6	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.042 (Feb. 2023)	0.20 (Dec. 2022)	0.121	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.05 (Mar. 2023)	0.10 (Dec. 2022)	0.075	-	IS:3025 (P-31)
13	Standard Plate Count	CFU/ml	51 (Mar 2023)	69 (Oct. 2022)	60	-	IS:1622
14	Total Coliform	MPN/100 ml	Absent	Absent	Absent	Absent	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023 SUMMARY

Sr. No.	Parameters	Unit	Test Results Berth No.14 (Inside the Port Area) as DWS			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.41 (Jan. 2023)	7.45 (Dec. 2022)	6.94	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	74 (Oct. 2022)	490 (Mar. 2023)	285	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	150 (Dec. 2022)	410 (Nov. 2022)	280	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	24 (Oct. 2022)	128 (Jan. 2023)	76	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	17.96 (Oct. 2022)	95.18 (Jan. 2023)	56.58	250	IS:3025 (P-32)
9	Sulphate as SO ₄	mg/l	15.34 (Feb. 2023)	32.58 (Mar. 2023)	23.98	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.014 (Feb. 2023)	0.21 (Dec. 2022)	0.127	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.008 (Dec. 2022)	0.098 (Mar. 2023)	0.053	-	IS:3025 (P-31)
13	Standard Plate Count	CFU/ml	50 (Jan. 2023)	56 (Oct. 2022)	54	-	IS:1822
14	Total Coliform	MPN/100 ml	Absent	Absent	Absent	Absent	IS:1822



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023 SUMMARY

Sr. No.	Parameters	Unit	Test Results Berth No.9 (Inside the Port Area) as DW9			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.48 (Jan. 2023)	7.30 (Dec. 2022)	6.89	6.5-8.5	IS:3025 (P-11)
2	Color	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 237 E4
5	Electrical Conductivity	us/cm	408 (Jan. 2023)	810 (Nov. 2022)	609.05	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	280 (Feb. 2023)	390 (Dec. 2022)	335	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	108 (Jan. 2023)	208 (Oct. 2022)	157	200	IS:3025 (P-21)
8	Chlorides as Cl ⁻	mg/l	40.32 (Nov. 2022)	111.96 (Oct. 2022)	76.45	250	IS:3025/P-32
9	Sulphate as SO ₄	mg/l	20.24 (Feb. 2023)	35.20 (Nov. 2022)	27.72	200	APHA 237 E4
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 237 E4
11	Ammonical Nitrogen	mg/l	0.072 (Jan. 2023)	0.22 (Dec. 2022)	0.146	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.040 (Feb. 2023)	0.81 (Dec. 2022)	0.425	-	IS:3025 (P-31)
13	Standard Plate Count	CFU/ml	43 (Mar. 2023)	54 (Dec. 2022)	48.5	-	IS:1622
14	Total Coliform	MPN/100 ml	Absent	Absent	Absent	Absent	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Test Results NMPA Guest House as DW10			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.24 (Jan. 2023)	7.90 (Dec. 2022)	7.07	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	66.8 (Oct. 2022)	250 (Feb. 2023)	158.40	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	96 (Mar. 2023)	154 (Oct. 2022)	130.4	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	16 (Oct. 2022)	110 (Dec. 2022)	83.5	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	6.69 (Dec. 2022)	30 (Feb. 2023)	17.84	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	6.19 (Jan. 2023)	14.54 (Feb. 2023)	10.36	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.024 (Dec. 2022)	0.074 (Oct. 2022)	0.049	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.038 (Jan. 2023)	0.078 (Dec. 2022)	0.058	-	IS:3025 (P-31)
13	Standard Plate Count	CFU/ml	48 (Feb. 2023)	67 (Dec. 2022)	52.5	-	IS:1622
14	Total Coliform	MPN/100 ml	Absent	Absent	Absent	Absent	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Test Results Marshalling Yard as DW11			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.48 (Jan. 2023)	7.80 (Dec. 2022)	7.14	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	75.75 (Nov. 2022)	220 (Feb. 2023)	147.89	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	86 (Mar. 2023)	170 (Dec. 2022)	128	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	34 (Jan. 2023)	105 (Feb. 2023)	69.50	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	18 (Mar. 2023)	35.59 (Jan. 2023)	26.94	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	5.29 (Oct. 2022)	18.44 (Feb. 2023)	12.30	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.015 (Feb. 2023)	0.105 (Oct. 2022)	0.064	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.043 (Jan. 2023)	0.081 (Nov. 2022)	0.064	-	IS:3025 (P-31)
13	Standard Plate Count	Col/ml	46 (Nov. 2022)	57 (Feb. 2023)	51.5	-	IS:1622
14	Total Coliform	MPN/100 ml	Absent	Absent	Absent	Absent	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023 SUMMARY

Sr. No.	Parameters	Unit	Test Results Wharf Open well (Inside Port Area)			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	7.05 (Jan. 2023)	7.55 (Dec. 2022)	7.3	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	561.6 (Oct. 2022)	695 (Dec. 2022)	628.3	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	354 (Mar. 2023)	470 (Dec. 2022)	412	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	96 (Jan. 2023)	354 (Mar. 2023)	225	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	48 (Mar. 2023)	68.32 (Feb. 2023)	58.16	250	IS:3025 (P-32)
9	Sulphate as SO ₄	mg/l	8.15 (Jan. 2023)	28.40 (Dec. 2022)	18.27	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.08 (Mar. 2023)	0.25 (Dec. 2022)	0.165	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.10 (Feb. 2023)	0.15 (Mar. 2023)	0.129	-	IS:3025 (P-31)
13	Standard Plate Count	CFU/ml	320 (Jan. 2023)	1582 (Dec. 2022)	951	-	IS:1522
14	Total Coliform	MPN/100 ml	Absent	Absent	Absent	Absent	IS:1522



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Test Results Fifth Avenue Open Well as S1			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.62 (Jan. 2023)	5.90 (Dec. 2022)	6.76	6.5-8.5	IS:3025 (P-11)
2	Color	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	113 (Jan. 2023)	225 (Dec. 2022)	169	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	146 (Feb. 2023)	501 (Dec. 2022)	323.5	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	64 (Mar. 2023)	115 (Jan. 2023)	69.5	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	20 (Feb. 2023)	45.96 (Nov. 2022)	32.90	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	6.86 (Mar. 2023)	11.42 (Nov. 2022)	9.14	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.02 (Feb. 2023)	0.20 (Nov. 2022)	0.22	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.05 (Jan. 2023)	0.25 (Nov. 2022)	0.15	-	IS:3025 (P-31)
13	Standard Plate Count	CFU/ml	846 (Jan. 2023)	1654 (Dec. 2022)	1250	-	IS:1622
14	Total Coliform	MPN/100 ml	40 (Jan. 2023)	66 (Mar. 2023)	54	Absent	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Test Results RCHW Colony Open Well as 52			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.54 (Jan. 2023)	6.95 (Dec. 2022)	6.745	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	106 (Jan. 2023)	230 (Dec. 2022)	169	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	136.5 (Feb. 2023)	375 (Nov. 2022)	255.5	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	44 (Oct. 2022)	120 (Jan. 2023)	82	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	18.20 (Feb. 2023)	35.7 (Jan. 2023)	25.77	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	7.89 (Oct. 2022)	13.45 (Dec. 2022)	10.60	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.03 (Mar. 2023)	0.096 (Oct. 2022)	0.065	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.04 (Jan. 2023)	0.08 (Feb. 2023)	0.068	-	IS:3025 (P-31)
13	Standard Plate Count	CFU/ml	742 (Feb. 2023)	1692 (Dec. 2022)	1220	-	IS:1622
14	Total Coliform	MPN/100 ml	39 (Feb. 2023)	48 (Mar. 2023)	43.5	Absent	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Test Results RCHW Colony New Open Well as S3			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.50 (Jan. 2023)	6.89 (Mar. 2023)	6.75	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed
5	Electrical Conductivity	us/cm	119 (Jan. 2023)	250 (Dec. 2022)	184.5	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	127 (Feb. 2023)	360 (Dec. 2022)	243.5	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	54 (Nov. 2022)	105 (Mar. 2023)	60	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	16.3 (Feb. 2023)	28.14 (Dec. 2022)	22.22	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	7.02 (Oct. 2022)	12.13 (Mar. 2023)	9.57	200	APHA 23 rd Ed
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed
11	Ammonical Nitrogen	mg/l	0.07 (Mar. 2023)	0.21 (Nov. 2022)	0.14	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ⁻³	mg/l	0.10 (Jan. 2023)	0.21 (Dec. 2022)	0.155	-	IS:3025 (P-31)
13	Standard Plate Count	Count	703 (Oct. 2021)	1565 (Dec. 2022)	1150	-	IS:1622
14	Total Coliform	MPN/100 ml	40 (Mar. 2023)	56 (Jan. 2023)	48	Absent	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Test Results Sump Tank (Pump House) as S4			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.73 (Feb. 2023)	7.05 (Dec. 2022)	6.89	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	uS/cm	177 (Jan. 2023)	320 (Dec. 2022)	248.5	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	117 (Feb. 2023)	420 (Dec. 2022)	268.5	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	56 (Oct. 2022)	120 (Dec. 2022)	88	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	14 (Feb. 2023)	32.12 (Dec. 2022)	23.06	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	7 (Feb. 2023)	15 (Nov. 2022)	11	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.01 (Feb. 2023)	0.22 (Nov. 2022)	0.115	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.10 (Mar. 2023)	0.40 (Dec. 2021)	0.25	-	IS:3025 (P-31)
13	Standard Plate Count	Col/ml	743 (Jan. 2023)	1604 (Dec. 2022)	1173.5	-	IS:1622
14	Total Coliform	MPN/1 00 ml	32 (Jan. 2023)	63 (Mar. 2023)	47.5	Absent	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023 SUMMARY

Sr. No.	Parameters	Unit	Test Results New UGR Open Well as S5			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.50 (Jan. 2023)	7.10 (Dec. 2022)	6.85	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	96.3 (Jan. 2023)	256 (Dec. 2022)	177.15	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	123 (Feb. 2023)	305 (Dec. 2022)	218	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	64 (Oct. 2022)	81 (Dec. 2022)	68.5	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	14 (Feb. 2023)	36.88 (Dec. 2022)	26.46	250	IS:3025/P-32
9	Sulphate as SO ₄	mg/l	6.50 (Jan. 2023)	13.04 (Mar. 2023)	9.77	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.09 (Feb. 2023)	0.25 (Dec. 2022)	0.18	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.10 (Oct. 2022)	0.15 (Nov. 2022)	0.125	-	IS:3025 (P-31)
13	Standard Plate Count	CFU/ml	642 (Jan. 2023)	1648 (Dec. 2022)	1150.60	-	IS:1622
14	Total Coliform	MPN/1 00 ml	25 (Jan. 2023)	49 (Feb. 2023)	37	Absent	IS:1622



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Test Results Timber Yard as S6			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.90 (Oct. 2022)	7.20 (Dec. 2022)	7.05	6.5-8.5	IS:3025 (P-11)
2	Color	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	uS/cm	181.5 (Jan. 2023)	348 (Dec. 2022)	265.6	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	152 (Mar. 2023)	350 (Dec. 2022)	253.6	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	80 (Jan. 2023)	100 (Feb. 2023)	80.5	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	23.78 (Mar. 2023)	42.98 (Oct. 2022)	33.96	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	6.80 (Dec. 2022)	21.95 (Oct. 2022)	15.17	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.07 (Mar. 2023)	0.22 (Dec. 2022)	0.145	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄ ⁻³	mg/l	0.11 (Mar. 2023)	0.20 (Nov. 2022)	0.155	-	IS:3025 (P-31)
13	Standard Plate Count	CFU/ml	783 (Feb. 2023)	1803 (Dec. 2022)	1185	-	IS:1822
14	Total Coliform	MPN/1 00 ml	33 (Jan. 2023)	58 (Mar. 2023)	45.5	Absent	IS:1822



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Drinking Water

Sample Drawn By: Nitya Laboratories

RESULT OF DRINKING WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Test Results Thimmappayya Well as S7			Requirement IS:10500	Protocol
			Minimum	Maximum	Average	Desirable	
1	pH	-	6.93 (Oct. 2022)	7.35 (Dec. 2022)	7.15	6.5-8.5	IS:3025 (P-11)
2	Colour	Hazen	<5	<5	<5	5	IS:3025 (P-4)
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (P-5)
4	Turbidity	NTU	<1	<1	<1	1	APHA 23 rd Ed.
5	Electrical Conductivity	us/cm	68.9 (Jan. 2023)	275 (Feb. 2023)	174.5	-	IS:3025 (P-14)
6	Total Dissolved Solids	mg/l	132 (Oct. 2022)	190 (Dec. 2022)	162.6	500	IS:3025 (P-16)
7	Total Hardness as (CaCO ₃)	mg/l	16 (Oct. 2022)	101 (Feb. 2023)	58.5	200	IS:3025 (P-21)
8	Chlorides as Cl	mg/l	17.85 (Jan. 2023)	26.46 (Feb. 2023)	22.20	250	IS:3025(P-32)
9	Sulphate as SO ₄	mg/l	6.35 (Oct. 2022)	15 (Feb. 2023)	11.60	200	APHA 23 rd Ed.
10	Iron (as Fe)	mg/l	ND	ND	ND	0.3	APHA 23 rd Ed.
11	Ammonical Nitrogen	mg/l	0.06 (Mar. 2023)	0.25 (Dec. 2022)	0.158	-	IS:3025 (P-34)
12	Total Phosphate as PO ₄	mg/l	0.09 (Mar. 2023)	0.25 (Nov. 2022)	0.186	-	IS:3025 (P-31)
13	Standard Plate Count	CFU/ml	403 (Jan. 2023)	1672 (Dec. 2022)	1039.5	-	IS:1622
14	Total Coliform	MPN/1 00 ml	12 (Jan. 2023)	70 (Mar. 2023)	41	Absent	IS:1622



5.0 Wastewater Sampling

5.1 Sampling Location

The Nitya Laboratories team in consultation with the Engineer In-charge of New Mangalore Port Authority, Paradip fixed the frequency and number of sampling stations. Accordingly, a Water sampling was conducted at 4 locations during the period from October 2021 to March 2022.

Table –5
Location of Wastewater Sampling Stations

Sr. No.	Location of Station	Frequency
1.	Treated Water	Once in a Month
2.	Sewage Collection Water	Once in a Month
3.	UF Field Tank	Once in a Month
4.	SBR TANK	Once in a Month

5.2 Results

The observations made on drinking water sampling at 4 locations have been presented through Table-2. Minimum and maximum values and arithmetic mean values of the 24-hour average concentrations have also been computed and presented.

5.3 Methodology

The samples for wastewater quality characterization were collected and analyzed as per the procedures specified in "Standard Method for the Examination of Water & Wastewater published by "American Public Health Association" (APHA: 23rd edition) and IS 3025. All the parameters except Heavy metals and Bacteriological were analyzed at the site i.e., at Panambur. Samples of heavy metals and bacteriological parameters have been sent to our Laboratory. Samples for chemical analysis were collected in polyethylene containers. Samples collected for metal content were acidified with 1 ml. HNO₃.

5.4 Results & Discussion on Observations

5.4.1 Treated Water

During the study period, at this location, pH was found between 7.28 to 7.80. Oil & Grease was found between 2.9 to 4.0 mg/l. BOD and COD were found between 5 to 18 mg/l and 24 to 70 mg/l respectively. The Mix Liquid Suspended Solids and Dissolved Oxygen were found between 90 to 200 mg/l and 5.0 to 6.0 mg/l. The Total Suspended Solids and Ammonical Nitrogen are found between 8 to 260 mg/l and 0.14 to 0.49 mg/l respectively. The Total Dissolved Solids and Total Nitrogen were found between 350 to 486 mg/l and 0.80 to 5.2 mg/l. The Faecal Coliform is found between 31 to 72 MPN/100ml. The Phenolic Compound is not detected during the analysis.

5.4.2 Sewage Collection Water

During the study period, at this location, pH was found between 6.50 to 7.50. Oil & Grease was found between 7.5 to 9.0 mg/l. BOD and COD were found between 64 to 140 mg/l and 258 to 480 mg/l respectively. The Mix Liquid Suspended Solids and Dissolved Oxygen were found between 332 to 400 mg/l and 0.4 to 1.5 mg/l. The Total Suspended Solids and Ammonical Nitrogen are found between 310 to 510 mg/l and 0.44 to 4.08 mg/l respectively. The Total Dissolved Solids and Total Nitrogen were found between 390 to 530 mg/l and 3.90 to 9.1 mg/l. The Faecal Coliform is found more than 1600 MPN/100 ml in month of Jan and March. The Phenolic Compound is not detected during the analysis.

5.4.3 UF Field Tank

During the study period, at this location, pH was found between 7.07 to 7.41. Oil & Grease was found between 2.5 to 10 mg/l. BOD and COD were found between 7 to 12 mg/l and 30 to 140 mg/l respectively. The Mix Liquid



Suspended Solids and Dissolved Oxygen were found between 108 to 150 mg/l and 5.20 to 5.8mg/l. The Total Suspended Solids and Ammonical Nitrogen are found between 20 to 182 mg/l and 0.105 to 0.36 mg/l respectively. The Total Dissolved Solids and Total Nitrogen were found between 190 to 600 mg/l and 0.40 to 4.0 mg/l. The Faecal Coliform is found between 148 to 348 MPN/100 ml. The Phenolic Compound is not detected during the analysis.

5.4.4 SBR Tank

During the study period, at this location, pH was found between 6.98 to 7.40. Oil & Grease was found between 3.1 to 26 mg/l. BOD and COD were found between 38 to 75 mg/l and 133 to 310 mg/l respectively. The Mix Liquid Suspended Solids and Dissolved Oxygen were found between 256 to 2600 mg/l and 0.6 to 4.1 mg/l. The Total Suspended Solids and Ammonical Nitrogen are found between 35 to 3500 mg/l and 0.31 to 2.4 mg/l respectively. The Total Dissolved Solids and Total Nitrogen were found between 395 to 490 mg/l and 2.0 to 8.20 mg/l. The Faecal Coliform is found more than 1600 MPN/100ml in month of Jan, Feb and March. The Phenolic Compound is not detected during the analysis.



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Wastewater (STP)

Sample Drawn By: NITYA LABORATORIES

RESULT OF WASTEWATER (STP) FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023 SUMMARY

Sr. No.	Parameters	Unit	Test Results Treated Water			Tolerance Limit as per KSPCB	Protocol
			Minimum	Maximum	Average		
1	pH	-	7.28 (Mar. 2023)	7.80 (Dec. 2022)	7.54	6.5-9.0	IS:3025 (P-11)
2	Colour	Hazen	16 (Oct. 2022)	28 (Feb. 2023)	22	-	IS:3025 (P-4)
3	Odour	-	Objectionable	Objectionable	Objectionable	-	IS:3025 (P-6)
4	Oil & Grease	mg/L	2.9 (Mar. 2023)	4.0 (Oct. 2022)	3.45	10	IS:3025 (P-39)
5	Bio-Chemical Oxygen Demand (3 days at 27°C) (BOD)	mg/L	5 (Oct. 2022)	16 (Feb. 2023)	11.5	≤10	IS:3025 (P-44)
6	Chemical Oxygen Demand as COD	NTU	34 (Oct. 2022)	70 (Feb. 2023)	48	≤50	IS:3025 (P-58)
7	Sludge Volume Index	mg/L	ND	ND	ND	-	APHA 23 rd E.O.
8	Mix Liquid Suspended Solids	mg/L	90 (Mar. 2023)	200 (Dec. 2022)	145	-	APHA 23 rd E.O.
9	Phenolic Compound	mg/L	ND	ND	ND	1.0	IS:3025 (P-43)
10	Dissolved Oxygen	mg/L	5.0 (Feb. 2023)	5.0 (Nov. 2022)	5.6	Min of 3	IS:3025 (P-36)
11	Total Suspended Solids	mg/L	8 (Feb. 2023)	260 (Dec. 2022)	136	≤20	IS:3025 (P-17)
12	Ammonical Nitrogen	mg/L	0.14 (Oct. 2022)	0.49 (Mar. 2023)	0.31	≤5	IS:3025 (P-34)
13	Electrical Conductivity	uS/cm	348 (Oct. 2022)	810 (Feb. 2023)	531.6	-	IS:3025 (P-14)
14	Total Dissolved Solids	mg/L	350 (Oct. 2022)	498 (Feb. 2023)	419	2100	IS:3025 (P-18)
15	Total Nitrogen	mg/L	0.80 (Mar. 2023)	5.3 (Dec. 2022)	3.34	≤10	IS:3025 (P-34)
16	Faecal Coliform	MPN/100 ml	31 (Feb. 2023)	72 (Oct. 2022)	51.5	<100	IS:1622



Test Report

Name of the Client New Mangalore Port Authority

Address of the Client Panambur, Mangalore -575010

Sample Description Wastewater (STP)

Sample Drawn By: Nitya Laboratories

RESULT OF WASTE WATER (STP) FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023 SUMMARY

Sr. No.	Parameters	Unit	Test Results Sewage Collection Water			Tolerance Limit as per KSPCB	Protocol
			Minimum	Maximum	Average		
1	pH	-	6.5 (Jan. 2023)	7.50 (Dec. 2022)	7.00	6.5-9.0	IS:3025 (P-11)
2	Colour	Hazen	25 (Jan. 2023)	122 (Feb. 2023)	72.5	-	IS:3025 (P-4)
3	Odour	-	Objectionable	Objectionable	Objectionable	-	IS:3025 (P-6)
4	Oil & Grease	mg/L	7.5 (Mar. 2023)	9.0 (Dec. 2022)	8.40	10	IS:3025 (P-39)
5	Bio-Chemical Oxygen Demand (3 days at 27°C) (BCD)	mg/L	64 (Oct. 2022)	140 (Feb. 2023)	102.4	≤10	IS:3025 (P-44)
6	Chemical Oxygen Demand as COD	NTU	258 (Oct. 2022)	480 (Feb. 2023)	370.1	≤50	IS:3025 (P-58)
7	Sludge Volume Index	mg/L	ND	ND	ND	-	APHA 23 rd ED.
8	Mix Liquid Suspended Solids	mg/L	332 (Mar. 2023)	400 (Dec. 2022)	366	-	APHA 23 rd ED.
9	Phenolic Compound	mg/L	ND	ND	ND	1.0	IS:3025 (P-43)
10	Dissolved Oxygen	mg/L	0.4 (Feb. 2023)	1.5 (Dec. 2022)	0.95	Min of 3	IS:3025 (P-38)
11	Total Suspended Solids	mg/L	310 (Feb. 2023)	510 (Nov. 2022)	410	≤20	IS:3025 (P-17)
12	Ammonical Nitrogen	mg/L	0.44 (Jan. 2023)	4.08 (Mar. 2023)	2.26	≤5	IS:3025 (P-34)
13	Electrical Conductivity	uS/cm	642.1 (Oct. 2022)	780 (Feb. 2023)	713	-	IS:3025 (P-14)
14	Total Dissolved Solids	mg/L	380 (Mar. 2023)	530 (Dec. 2022)	465	2100	IS:3025 (P-16)
15	Total Nitrogen	mg/L	3.90 (Mar. 2023)	9.10 (Dec. 2022)	6.72	≤10	IS:3025 (P-34)
16	Faecal Coliform	MPN/100 ml	1542	1900	1571	≤100	IS:1632



Test Report

Name of the Client: New Mangalore Port Authority

Address of the Client: Panambur, Mangalore -575010

Sample Description: Wastewater (STP)

Sample Drawn By: Nitya Laboratories

RESULT OF WASTEWATER (STP) FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023 SUMMARY

Sr. No.	Parameters	Unit	Test Results UF Field Tank			Tolerance Limit as per KSPCB	Protocol
			Minimum	Maximum	Average		
1	pH	-	7.07 (Jan. 2023)	7.41 (Oct. 2022)	7.24	6.5-9.0	IS:3025 (P-11)
2	Colour	Hazen	18 (Oct. 2022)	125 (Dec. 2022)	73.5	-	IS:3025 (P-4)
3	Odour	-	Objectionable	Objectionable	Objectionable	-	IS:3025 (P-6)
4	Oil & Grease	mg/L	2.5 (Mar. 2023)	10 (Oct. 2022)	6.25	10	IS:3025 (P-36)
5	Bio-Chemical Oxygen Demand (3 days at 27°C) (BOD)	mg/L	7 (Jan. 2023)	12 (Dec. 2022)	9.55	≤10	IS:3025 (P-44)
6	Chemical Oxygen Demand as COD	NTU	30 (Dec. 2022)	140 (Feb. 2023)	85	≤50	IS:3025 (P-56)
7	Sludge Volume Index	mg/L	-	-	-	-	APHA 23 rd ED.
8	Mix Liquid Suspended Solids	mg/L	108 (Jan. 2023)	150 (Dec. 2022)	129.5	-	APHA 23 rd ED.
9	Phenolic Compound	mg/L	ND	ND	ND	1.0	IS:3025 (P-43)
10	Dissolved Oxygen	mg/L	5.20 (Dec. 2022)	5.8 (Jan. 2023)	5.40	Min of 3	IS:3025 (P-38)
11	Total Suspended Solids	mg/L	20 (Feb. 2023)	182 (Jan. 2023)	106.90	≤30	IS:3025 (P-17)
12	Ammonical Nitrogen	mg/L	0.105 (Oct. 2022)	0.36 (Mar. 2023)	0.23	≤5	IS:3025 (P-34)
13	Electrical Conductivity	uS/cm	305 (Feb. 2023)	900 (Dec. 2022)	606.2	-	IS:3025 (P-14)
14	Total Dissolved Solids	mg/L	190 (Feb. 2023)	600 (Dec. 2022)	396	≤100	IS:3025 (P-18)
15	Total Nitrogen	mg/L	0.40 (Mar. 2023)	4.0 (Dec. 2023)	2.30	≤10	IS:3025 (P-34)
16	Faecal Coliform	MPN/100 ml	148 (Feb. 2023)	348 (Nov. 2022)	253	≤100	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of the Client: Panambur, Mangalore - 575010

Sample Description: Wastewater (STP)

Sample Drawn By: Nitya Laboratories

RESULT OF WASTE WATER (STP) FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023 SUMMARY

Sr. No.	Parameters	Unit	Test Results SBR TANK			Tolerance Limit as per KSPCB	Protocol
			Minimum	Maximum	Average		
1	pH	-	6.98 (Jan. 2023)	7.40 (Dec. 2022)	7.19	6.5-9.0	IS:3025 (P-11)
2	Colour	Hazen	30 (Mar. 2023)	50 (Dec. 2022)	40	-	IS:3025 (P-4)
3	Odour	-	Objectionable	Objectionable	Objectionable	-	IS:3025 (P-6)
4	Oil & Grease	mg/L	3.1 (Mar. 2023)	26 (Oct. 2022)	15.65	10	IS:3025 (P-38)
5	Bio-Chemical Oxygen Demand (3 days at 27°C) (BOD)	mg/L	38 (Jan. 2023)	75 (Nov. 2022)	56.55	≤10	IS:3025 (P-44)
6	Chemical Oxygen Demand as COD	NTU	133 (Jan. 2023)	310 (Dec. 2022)	221.5	≤50	IS:3025 (P-58)
7	Sludge Volume Index	mg/L	20 (Dec. 2022)	60 (Jan. 2023)	38.05	-	APHA 23 rd ED.
8	Mix Liquid Suspended Solids	mg/L	256 (Mar. 2023)	2500 (Dec. 2022)	1047	-	APHA 23 rd ED.
9	Phenolic Compound	mg/L	ND	ND	ND	1.0	IS:3025 (P-43)
10	Dissolved Oxygen	mg/L	0.6 (Oct. 2022)	4.1 (Feb. 2023)	2.38	Min of 3	IS:3025 (P-38)
11	Total Suspended Solids	mg/L	95 (Feb. 2023)	3500 (Dec. 2022)	1787.6	≤20	IS:3025 (P-17)
12	Ammonical Nitrogen	mg/L	0.31 (Oct. 2022)	2.4 (Mar. 2023)	1.36	≤5	IS:3025 (P-34)
13	Electrical Conductivity	µS/cm	582 (Nov. 2022)	680 (Feb. 2023)	632	-	IS:3025 (P-14)
14	Total Dissolved Solids	mg/L	395 (Mar. 2023)	490 (Dec. 2022)	442.5	2100	IS:3025 (P-16)
15	Total Nitrogen	mg/L	2.0 (Mar. 2023)	8.20 (Dec. 2022)	5.25	≤10	IS:3025 (P-34)
16	Faecal Coliform	MPN/100 ml	1520	1900	1560	<100	IS:1622



4.2. Environmental Monitoring

4.2.1. Air Quality Monitoring

Table with 2 columns: S.No. and Description. The table lists various air quality monitoring stations and their locations. The text is very faint and difficult to read, but the structure is as follows:

S.No.	Description
1	Station 1: [Illegible]
2	Station 2: [Illegible]
3	Station 3: [Illegible]
4	Station 4: [Illegible]
5	Station 5: [Illegible]
6	Station 6: [Illegible]
7	Station 7: [Illegible]
8	Station 8: [Illegible]
9	Station 9: [Illegible]
10	Station 10: [Illegible]
11	Station 11: [Illegible]
12	Station 12: [Illegible]
13	Station 13: [Illegible]
14	Station 14: [Illegible]
15	Station 15: [Illegible]
16	Station 16: [Illegible]
17	Station 17: [Illegible]
18	Station 18: [Illegible]
19	Station 19: [Illegible]
20	Station 20: [Illegible]

MARINE WATER QUALITY MONITORING

4.2.2. Water Quality Monitoring

The marine water quality monitoring is carried out at various locations in the port area. The data collected is used to assess the impact of port activities on the surrounding environment. The monitoring is done in accordance with the standards set by the Government of India.

4.2.3. Noise Monitoring

Noise monitoring is carried out at various locations in the port area. The data collected is used to assess the impact of port activities on the surrounding environment. The monitoring is done in accordance with the standards set by the Government of India.



6.0 Marine Water Sampling

6.1 Sampling Location

The Nitya Laboratories team in consultation with the Engineer In-charge of New Mangalore Port Authority, Paradip fixed the frequency and number of sampling stations. Accordingly, a Marine Water sampling was conducted at 6 locations of each three depth during the period from October 2022 to March 2023.

Table - 6
Location of Marine Water Sampling Stations

Sr. No.	Location of Station	Frequency
1.	Eastern Dock Arm (Marine)-1m Below Surface	Once in a Month
2.	Eastern Dock Arm (Marine)-10 m Below Surface	Once in a Month
3.	Eastern Dock Arm (Marine)-20 m Below Surface	Once in a Month
4.	Baseline (Up to 800-meter west)-1m Below Surface	Once in a Month
5.	Baseline (Up to 800-meter west)-10 m Below Surface	Once in a Month
6.	Baseline (Up to 800-meter west)-20 m Below Surface	Once in a Month
7.	Western Dock Arm -1m Below Surface	Once in a Month
8.	Western Dock Arm -10 m Below Surface	Once in a Month
9.	Western Dock Arm -20 m Below Surface	Once in a Month
10.	Oil Dock Arm (Diaphragm Jetty)-1m Below Surface	Once in a Month
11.	Oil Dock Arm (Diaphragm Jetty)-10 m Below Surface	Once in a Month
12.	Oil Dock Arm (Diaphragm Jetty)-20 m Below Surface	Once in a Month
13.	Lagoon Area (Turning Circle)-1m Below Surface	Once in a Month
14.	Lagoon Area (Turning Circle)-10 m Below Surface	Once in a Month
15.	Lagoon Area (Turning Circle)-20 m Below Surface	Once in a Month

6.2 Methodology

The samples for surface water quality characterization were collected and analyzed as per the procedures specified in "Standard Method for the Examination of Water & Wastewater published by "American Public Health Association" (APHA; 23rd edition) and IS 3025. All the parameters except Heavy metals and Bacteriological were analyzed at the site i.e., at Panambur. Samples of heavy metals and bacteriological parameters have been sent to our Laboratory. Samples for chemical analysis were collected in polyethylene containers. Samples collected for metal content were acidified with 1 ml. HNO₃.

6.3 Results

The observations made on drinking water sampling at 5 locations have been presented through Table-2. Minimum and maximum values and arithmetic mean values of the 24-hour average concentrations have also been computed and presented.



6.4 Results & Discussion on Observations

6.4.1 Eastern Dock Arm

Surface: At this location pH was found between 7.80 to 7.99. The TSS and TDS were found between 336 to 2420 mg/l and 36516 to 44420 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.113 to 0.73 mg/l, 616 to 1405 mg/l and 545.9 to 845.97 mg/l. Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO was found between 2.0 to 3.1 mg/l. The value of Calcium, Sodium and Potassium were found between 344 to 1210 mg/l, 10124 to 11243 mg/l and 380 to 983 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.10 to 0.27 mg/l, 0.065 to 0.08 mg/l and 40750 to 50130 mg/l. The Faecal Coliform was found between 6 to 275 MPN/100 ml.

Middle: At this location pH was found between 7.95 to 8.15. The TSS and TDS were found between 755 to 2500 mg/l and 36421 to 44624 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.124 to 0.74 mg/l, 626 to 1450 mg/l and 551 to 851 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO was found between 2.1 to 2.6 mg/l. The value of Calcium, Sodium and Potassium were found between 352 to 1210 mg/l, 10975 to 11432 mg/l and 426 to 820 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.15 to 0.38 mg/l, 0.07 to 0.09 mg/l and 38680 to 49300 mg/l. The Faecal Coliform was found between 15 to 286 MPN/100 ml.

Bottom: At this location pH was found between 7.74 to 7.98. The TSS and TDS were found between 810 to 2530 mg/l and 38504 to 42900 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.136 to 0.86 mg/l, 836 to 1490 mg/l and 496 to 848.22 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO was found between 2.0 to 2.6 mg/l. The value of Calcium, Sodium and Potassium were found between 352 to 1220 mg/l, 10196 to 12590 mg/l and 438 to 860 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.23 to 0.45 mg/l, 0.07 to 0.08 mg/l and 41230 to 46460 mg/l. The Faecal Coliform was found between 26 to 245 MPN/100 ml.

6.4.2 Eastern Baseline (Up to 800-meter west)

Surface: At this location pH was found between 7.80 to 8.30. The TSS and TDS were found between 742 to 2530 mg/l and 37008 to 45460 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.102 to 0.80 mg/l, 516 to 1390.93 mg/l and 546.7 to 846.78 mg/l. Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO was found between 2.1 to 3.2 mg/l. The value of Calcium, Sodium and Potassium were found between 300 to 1200 mg/l, 9840 to 10096 mg/l and 303 to 710 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.05 to 0.22 mg/l, 0.06 to 0.09 mg/l and 40312 to 46854 mg/l. The Faecal Coliform was found between 17 to 315 MPN/100 ml.

Middle: At this location pH was found between 7.80 to 8.12. The TSS and TDS were found between 852 to 2500 mg/l and 36241 to 44400 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.147 to 0.80 mg/l, 526 to 1393.84 mg/l and 557 to 870 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO was found between 2.0 to 2.8 mg/l. The value of Calcium, Sodium and Potassium were found between 310 to 1210 mg/l, 9125 to 10135 mg/l and 310 to 760 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.19 to 0.30 mg/l, 0.062 to 0.10 mg/l and 37450 to 46408 mg/l. The Faecal Coliform was found between 8 to 358 MPN/100 ml.

Bottom: At this location pH was found between 7.85 to 8.16. The TSS and TDS were found between 876 to 2430 mg/l and 38586 to 44648 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.58 to 0.95 mg/l, 526 to 1398.37 mg/l and 580 to 846.78 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO was found between 2.0 to 2.8 mg/l. The value of Calcium, Sodium and Potassium were found between 327 to 121 mg/l, 9845 to 10140 mg/l and 352 to 990 mg/l. The value of Nitrite, Phosphate and Total Solids were



found between 0.18 to 0.38 mg/l, 0.05 to 0.102 mg/l and 41150 to 46990 mg/l. The Faecal Coliform was found between 17 to 338 MPN/100 ml.

6.4.3 Western Dock Arm

Surface: At this location pH was found between 7.95 to 8.30. The TSS and TDS were found between 858 to 2236 mg/l and 38074 to 43320 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.124 to 0.80 mg/l, 670 to 1420 mg/l and 543.8 to 843.89 mg/l. Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO was found between 2.1 to 3.2 mg/l. The value of Calcium, Sodium and Potassium were found between 310 to 1220 mg/l, 9950 to 11429 mg/l and 330 to 770 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.09 to 0.41 mg/l, 0.06 to 0.09 mg/l and 40143 to 48342 mg/l. The Faecal Coliform was found between 20 to 228 MPN/100 ml.

Middle: At this location pH was found between 7.94 to 8.20. The TSS and TDS were found between 862 to 2239 mg/l and 38321 to 42396 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.124 to 0.75 mg/l, 740 to 1381.21 mg/l and 580 to 853.04 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO & Iron was found between 2.0 to 2.7 mg/l and 0.029 to 0.015 mg/l. The value of Calcium, Sodium and Potassium were found between 336 to 1210 mg/l, 10110 to 10945 mg/l and 350 to 1010 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.15 to 0.51 mg/l, 0.04 to 0.09 mg/l and 40395 to 48450 mg/l. The Faecal Coliform was found between 34 to 232 MPN/100 ml.

Bottom: At this location pH was found between 8.01 to 8.15. The TSS and TDS were found between 750 to 2400 mg/l and 37976 to 44640 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.136 to 0.81 mg/l, 520 to 1393.84 mg/l and 510 to 844 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO & Iron was found between 2.0 to 2.7 mg/l and 0.034 to 0.20 mg/l. The value of Calcium, Sodium and Potassium were found between 334 to 1250 mg/l, 10220 to 12395 mg/l and 378 to 1122 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.20 to 0.60 mg/l, 0.064 to 0.08 mg/l and 40321 to 48650 mg/l. The Faecal Coliform was found between 39 to 349 MPN/100 ml.

6.4.4 Oil Dock Arm (Diaphragm Jetty)

Surface: At this location pH was found between 7.75 to 8.01. The TSS and TDS were found between 844 to 2510 mg/l and 39314 to 43549 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.136 to 0.71 mg/l, 740 to 1457 mg/l and 554.9 to 854.97 mg/l. Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO was found between 2.1 to 3.3 mg/l. The value of Calcium, Sodium and Potassium were found between 328 to 1513 mg/l, 8850 to 11943 mg/l and 356 to 550 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.04 to 0.42 mg/l, 0.05 to 0.22 mg/l and 42396 to 49259 mg/l. The Faecal Coliform was found between 5 to 345 MPN/100 ml.

Middle: At this location pH was found between 7.93 to 8.05. The TSS and TDS were found between 750 to 2569 mg/l and 38148 to 43630 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.136 to 0.71 mg/l, 642 to 1491 mg/l and 569.3 to 846.30 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO & Iron was found between 2.0 to 2.8 mg/l and 0.006 to 0.15 mg/l. The value of Calcium, Sodium and Potassium were found between 352 to 1597 mg/l, 9142 to 11632 mg/l and 398 to 690 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.09 to 0.50 mg/l, 0.04 to 0.14 mg/l and 40613 to 48793 mg/l. The Faecal Coliform was found between 17 to 310 MPN/100 ml.

Bottom: At this location pH was found between 7.45 to 8.18. The TSS and TDS were found between 866 to 2415 mg/l and 37711 to 43644 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.124 to 0.71 mg/l, 593 to 1390 mg/l and 560 to 847.26 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO & Iron was found between 2.0 to 2.7 mg/l and 0.040 to 0.15 mg/l. The value of Calcium, Sodium and



Potassium were found between 352 to 1473 mg/l, 9536 to 11321 mg/l and 406 to 720 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.10 to 0.70 mg/l, 0.035 to 0.12 mg/l and 39940 to 48976 mg/l. The Faecal Coliform was found between 33 to 270 MPN/100 ml.

6.4.5 Lagoon Area (Turning Circle)

Surface: At this location pH was found between 7.80 to 8.05. The TSS and TDS were found between 838 to 2610 mg/l and 33475 to 46930 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.037 to 0.82 mg/l, 610 to 1401 mg/l and 546.3 to 846.30 mg/l. Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO & Iron was found between 2.0 to 3.0 mg/l and 0.029 to 0.25 mg/l. The value of Calcium, Sodium and Potassium were found between 328 to 1501 mg/l, 8850 to 11693 mg/l and 320 to 500 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.01 to 0.33 mg/l, 0.08 to 0.20 mg/l and 35390 to 48949 mg/l. The Faecal Coliform was found between 5 to 295 MPN/100 ml.

Middle: At this location pH was found between 7.95 to 8.10. The TSS and TDS were found between 843 to 2590 mg/l and 35460 to 43920 mg/l respectively. This value of Nitrate, Magnesium and Sulphate were found between 0.13 to 0.84 mg/l, 675 to 1399 mg/l and 560 to 844.38 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO & Iron was found between 2.1 to 2.8 mg/l and 0.030 to 0.40 mg/l. The value of Calcium, Sodium and Potassium were found between 336 to 1496 mg/l, 9120 to 11421 mg/l and 336 to 666 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.07 to 0.50 mg/l, 0.06 to 0.19 mg/l and 36498 to 47849 mg/l. The Faecal Coliform was found between 14 to 257 MPN/100 ml.

Bottom: At this location pH was found between 7.44 to 8.13. The TSS and TDS were found between 874 to 2410 mg/l and 36750 to 44642 mg/l respectively. The value of Nitrate, Magnesium and Sulphate were found between 0.124 to 0.98 mg/l, 680 to 1396 mg/l and 580 to 851.52 mg/l. The Oil & Grease, Silica, Total Nitrogen & Organic Nitrogen were absent during the analysis. The DO & Iron was found between 2.0 to 2.7 mg/l and 0.04 to 0.55 mg/l. The value of Calcium, Sodium and Potassium were found between 344 to 1470 mg/l, 9651 to 11394 mg/l and 388 to 580 mg/l. The value of Nitrite, Phosphate and Total Solids were found between 0.09 to 0.70 mg/l, 0.05 to 0.12 mg/l and 37940 to 47910 mg/l. The Faecal Coliform was found between 14 to 310 MPN/100 ml.



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of the Client: Panambur, Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023 SUMMARY

Sr. No.	Parameters	Unit	Eastern Dock Arm (Marine)-1m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	-	7.80 (Nov. 2022)	7.99 (Oct. 2022)	7.89	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	336 (Mar. 2023)	2420 (Dec. 2022)	1382	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	36516 (Jan. 2023)	44420 (Dec. 2022)	40474.20	IS:3025 (P-16)
4	Turbidity	NTU	5.8 (Jan. 2023)	7.6 (Dec. 2022)	6.74	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.113 (Jan. 2023)	0.73 (Dec. 2022)	0.426	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	616 (Dec. 2022)	1405 (Nov. 2022)	1012.5	IS:3025 (P-48)
7	Sulphates As SO ₄	mg/L	545.9 (Mar. 2023)	845.97 (Jan. 2023)	695.56	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	2.0 (Oct. 2022)	3.1 (Mar. 2023)	2.56	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.010 (Jan. 2023)	0.25 (Mar. 2023)	0.134	APHA 23rd Ed.
11	Calcium As Ca	mg/L	344 (Oct. 2022)	1210 (Dec. 2022)	776	IS:3025 (P-40)
12	Sodium As Na	mg/L	10124 (Oct. 2022)	11243 (Feb. 2023)	1068.5	IS:3025 (P-46)
13	Potassium As K	mg/L	380 (Oct. 2022)	993 (Mar. 2023)	681.5	IS:3025 (P-45)
14	Nitrite	mg/L	0.10 (Mar. 2023)	0.27 (Dec. 2022)	0.185	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.065 (Nov. 2022)	0.08 (Oct. 2022)	0.072	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	40750 (Feb. 2023)	50130 (Dec. 2022)	45440	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 MI	8 (Jan. 2023)	275 (Dec. 2022)	145.6	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of the Client: Panambur, Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023 SUMMARY

Sr. No.	Parameters	Unit	Eastern Dock Arm (Marine)-10 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	-	7.05 (Jan. 2023)	8.15 (Dec. 2022)	8.05	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	755 (Feb. 2023)	2500 (Dec. 2022)	1838.15	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	36421 (Feb. 2023)	44624 (Mar. 2023)	40522.5	IS:3025 (P-16)
4	Turbidity	NTU	5.6 (Feb. 2023)	7.4 (Dec. 2022)	6.56	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.124 (Jan. 2023)	0.74 (Dec. 2022)	0.436	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	626 (Dec. 2022)	1450 (Nov. 2022)	1038	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	551 (Mar. 2023)	851 (Jan. 2023)	701	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	2.1 (Oct. 2022)	2.6 (Dec. 2022)	2.36	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.028 (Oct. 2022)	0.30 (Mar. 2023)	0.164	APHA 23rd Ed
11	Calcium As Ca	mg/L	352 (Oct. 2022)	1210 (Dec. 2022)	782.6	IS:3025 (P-40)
12	Sodium As Na	mg/L	10675 (Nov. 2022)	11432 (Jan. 2023)	11203.5	IS:3025 (P-45)
13	Potassium As K	mg/L	425 (Oct. 2022)	820 (Mar. 2023)	623	IS:3025 (P-45)
14	Nitrite	mg/L	0.15 (Feb. 2023)	0.38 (Dec. 2022)	0.26	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.07 (Jan. 2023)	0.09 (Mar. 2023)	0.082	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	38680 (Feb. 2023)	49300 (Dec. 2022)	43990	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 Ml	15 (Jan. 2023)	286 (Oct. 2022)	155.60	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur, Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Eastern Dock Arm (Marine)-20 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	-	7.74 (Jan. 2023)	8.17 (Dec. 2022)	7.98	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	810 (Feb. 2023)	2530 (Dec. 2022)	1382	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	38504 (Jan. 2023)	42900 (Dec. 2022)	40702.6	IS:3025 (P-16)
4	Turbidity	NTU	5.7 (Mar. 2023)	7.2 (Dec. 2022)	6.45	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.136 (Jan. 2023)	0.86 (Jan. 2023)	0.49	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	636 (Dec. 2022)	1490 (Nov. 2022)	1065.6	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	496 (Oct. 2022)	648.22 (Jan. 2023)	674.11	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	2.0 (Oct. 2022)	2.6 (Jan. 2023)	2.34	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.034 (Nov. 2022)	0.30 (Mar. 2023)	0.169	APHA 23rd Ed
11	Calcium As Ca	mg/L	352 (Oct. 2022)	1220 (Dec. 2022)	786.6	IS:3025 (P-40)
12	Sodium As Na	mg/L	10196 (Oct. 2022)	12590 (Feb. 2023)	11396.4	IS:3025 (P-45)
13	Potassium As K	mg/L	438 (Oct. 2022)	860 (Mar. 2023)	651.2	IS:3025 (P-45)
14	Nitrite	mg/L	0.23 (Mar. 2023)	0.45 (Dec. 2022)	0.34	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.07 (Nov. 2022)	0.08 (Dec. 2022)	0.076	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	41230 (Feb. 2023)	46460 (Dec. 2022)	43844	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 ml	26 (Jan. 2023)	245 (Dec. 2022)	136.5	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Baseline (Up to 800-meter west)-1m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	-	7.80 (Feb. 2023)	8.30 (Dec. 2022)	8.05	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	742 (Feb. 2023)	2530 (Dec. 2022)	1636	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	37008 (Jan. 2023)	45460 (Dec. 2022)	41234	IS:3025 (P-16)
4	Turbidity	NTU	5.6 (Jan. 2023)	6.5 (Dec. 2022)	6.05	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.102 (Jan. 2023)	0.80 (Dec. 2022)	0.456	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	516 (Dec. 2022)	1390.93 (Oct. 2022)	953.46	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	546.7 (Mar. 2023)	846.78 (Jan. 2023)	696.39	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	2.1 (Oct. 2022)	3.2 (Mar. 2023)	2.65	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.023 (Oct. 2022)	0.30 (Dec. 2022)	0.161	APHA 23rd Ed.
11	Calcium As Ca	mg/L	300 (Nov. 2022)	1200 (Dec. 2022)	756.6	IS:3025 (P-40)
12	Sodium As Na	mg/L	9840 (Feb. 2023)	10096 (Oct. 2022)	9968	IS:3025 (P-45)
13	Potassium As K	mg/L	303 (Nov. 2022)	710 (Mar. 2023)	506.5	IS:3025 (P-45)
14	Nitrite	mg/L	0.05 (Mar. 2023)	0.22 (Dec. 2022)	0.135	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.06 (Feb. 2023)	0.09 (Mar. 2023)	0.075	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	40312 (Feb. 2023)	46854 (Oct. 2022)	43583.3	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 ML	17 (Jan. 2023)	315 (Dec. 2022)	167.66	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur, Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Baseline (Up to 800-meter west)-10 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH		7.8 (Nov. 2022)	8.12 (Mar. 2023)	7.96	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	852 (Mar. 2023)	2500 (Dec. 2022)	1691.2	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	36241 (Feb. 2023)	44400 (Dec. 2022)	40320.5	IS:3025 (P-16)
4	Turbidity	NTU	5.2 (Nov. 2022)	6.0 (Feb. 2023)	5.6	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.147 (Jan. 2023)	0.60 (Feb. 2023)	0.473	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	526 (Dec. 2022)	1383.3 (Oct. 2022)	959.92	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	557 (Nov. 2022)	670 (Feb. 2023)	713.5	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	2.0 (Oct. 2022)	2.8 (Mar. 2023)	2.60	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.025 (Nov. 2022)	0.25 (Mar. 2023)	0.137	APHA 23rd Ed.
11	Calcium As Ca	mg/L	316 (Nov. 2022)	1210 (Dec. 2022)	760.24	IS:3025 (P-40)
12	Sodium As Na	mg/L	9125 (Mar. 2023)	10135 (Oct. 2022)	9630.21	IS:3025 (P-45)
13	Potassium As K	mg/L	310 (Nov. 2022)	760 (Mar. 2023)	536	IS:3025 (P-45)
14	Nitrite	mg/L	0.19 (Mar. 2023)	0.30 (Dec. 2022)	0.246	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.062 (Oct. 2022)	0.10 (Mar. 2023)	0.062	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	37450 (Feb. 2023)	48408 (Oct. 2022)	42929.62	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 ml	8 (Jan. 2023)	356 (Dec. 2022)	183.24	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur, Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Baseline (Up to 800-meter west)-20 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH		7.85 (Nov. 2022)	8.16 (Mar. 2023)	8.02	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	876 (Mar. 2023)	2430 (Dec. 2022)	1653	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	38586 (Jan. 2023)	44648 (Mar. 2023)	41628.2	IS:3025 (P-16)
4	Turbidity	NTU	5.1 (Mar. 2023)	6.2 (Feb. 2023)	5.65	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.58 (Mar. 2023)	0.55 (Feb. 2023)	0.76	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	526 (Dec. 2022)	1358.37 (Jan. 2023)	962.15	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	580 (Nov. 2022)	846.78 (Jan. 2023)	713.69	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	2.0 (Oct. 2022)	2.8 (Dec. 2022)	2.48	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.031 (Nov. 2022)	0.30 (Mar. 2023)	0.165	APHA 23rd Ed.
11	Calcium As Ca	mg/L	327 (Nov. 2022)	1210 (Dec. 2022)	768.5	IS:3025 (P-40)
12	Sodium As Na	mg/L	9945 (Jan. 2023)	10140 (Oct. 2022)	9992.5	IS:3025 (P-45)
13	Potassium As K	mg/L	352 (Nov. 2022)	990 (Mar. 2023)	671.6	IS:3025 (P-45)
14	Nitrite	mg/L	0.18 (Mar. 2023)	0.38 (Dec. 2022)	0.28	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.050 (Feb. 2023)	0.102 (Mar. 2023)	0.076	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	41150 (Feb. 2023)	49990 (Dec. 2022)	44070.6	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 ML	17 (Feb. 2023)	338 (Dec. 2022)	177.56	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Western Dock Arm -1m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	-	7.98 (Oct. 2022)	8.30 (Dec. 2022)	8.12	IS:3025 (P-11)
2	Total Suspended Solids	mg/l.	858 (Mar. 2023)	2238 (Oct. 2022)	1548	IS:3025 (P-17)
3	Total Dissolved Solids	mg/l.	38074 (Jan. 2023)	43320 (Nov. 2022)	40697.3	IS:3025 (P-16)
4	Turbidity	NTU	5.9 (Mar. 2023)	6.5 (Nov. 2022)	6.26	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/l.	0.124 (Jan. 2023)	0.80 (Dec. 2022)	0.462	IS:3025 (P-34)
6	Magnesium As Mg	mg/l.	670 (Dec. 2022)	1420 (Nov. 2022)	1045	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/l.	543.8 (Mar. 2023)	943.89 (Jan. 2023)	665.44	IS:3025 (P-24)
8	Oil & Grease	mg/l.	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/l.	2.1 (Oct. 2022)	3.2 (Mar. 2023)	2.65	IS:3025 (P-38)
10	Iron As Fe	mg/l.	0.022 (Oct. 2022)	0.10 (Mar. 2023)	0.061	APHA 23rd Ed.
11	Calcium As Ca	mg/l.	310 (Nov. 2022)	1220 (Dec. 2022)	311.92	IS:3025 (P-40)
12	Sodium As Na	mg/l.	9950 (Mar. 2023)	11429 (Dec. 2022)	10689.52	IS:3025 (P-45)
13	Potassium As K	mg/l.	330 (Oct. 2022)	770 (Mar. 2023)	562.1	IS:3025 (P-45)
14	Nitrite	mg/l.	0.09 (Mar. 2023)	0.41 (Jan. 2023)	0.25	IS:3025 (P-34)
15	Phosphate As P	mg/l.	0.060 (Nov. 2022)	0.08 (Dec. 2022)	0.076	IS:3025 (P-31)
16	Silica As SiO ₂	mg/l.	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/l.	40143 (Feb. 2023)	46342 (Nov. 2022)	44242.5	IS:3025 (P-15)
18	Total Nitrogen	mg/l.	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/l.	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 ml	20 (Jan. 2023)	228 (Oct. 2022)	129.30	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur, Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Western Dock Arm-10 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH		7.94 (Mar. 2023)	8.20 (Dec. 2022)	8.07	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	862 (Mar. 2023)	2239 (Oct. 2022)	1550.5	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	38321 (Feb. 2023)	42396 (Nov. 2022)	40358.2	IS:3025 (P-16)
4	Turbidity	NTU	5.8 (Mar. 2022)	6.3 (Oct. 2022)	6.05	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.124 (Jan. 2023)	0.75 (Dec. 2022)	0.439	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	740 (Dec. 2022)	1381.21 (Oct. 2022)	1060.56	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	580 (Mar. 2023)	853.04 (Jan. 2023)	716.52	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	2.0 (Oct. 2022)	2.7 (Jan. 2023)	2.35	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.029 (Nov. 2022)	0.15 (Mar. 2023)	0.089	APHA 23rd Ed.
11	Calcium As Ca	mg/L	336 (Oct. 2022)	1210 (Dec. 2022)	776.2	IS:3025 (P-40)
12	Sodium As Na	mg/L	10110 (Mar. 2023)	10954 (Jan. 2023)	10532	IS:3025 (P-45)
13	Potassium As K	mg/L	350 (Oct. 2022)	1010 (Mar. 2023)	686.5	IS:3025 (P-45)
14	Nitrite	mg/L	0.15 (Mar. 2023)	0.51 (Jan. 2023)	0.35	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.04 (Mar. 2023)	0.09 (Dec. 2022)	0.065	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	40395 (Feb. 2023)	48450 (Nov. 2022)	44422.5	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 ml	34 (Feb. 2023)	232 (Dec. 2022)	132.6	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur, Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Western Dock Arm -20 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH		8.01 (Mar. 2023)	8.30 (Dec. 2022)	8.15	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	750 (Feb. 2023)	2400 (Dec. 2022)	1575	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	37976 (Jan. 2023)	44640 (Mar. 2023)	41308.21	IS:3025 (P-16)
4	Turbidity	NTU	5.4 (Mar. 2023)	6.5 (Feb. 2022)	5.96	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.136 (Jan. 2023)	0.81 (Dec. 2022)	0.48	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	520 (Dec. 2022)	1393.84 (Oct. 2022)	956.92	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	510 (Nov. 2022)	844 (Jan. 2023)	677	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	2.0 (Nov. 2022)	2.7 (Jan. 2023)	2.34	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.034 (Nov. 2022)	0.20 (Feb. 2023)	0.11	APHA 23rd Ed
11	Calcium As Ca	mg/L	344 (Oct. 2022)	1250 (Dec. 2022)	708.2	IS:3025 (P-40)
12	Sodium As Na	mg/L	10220 (Oct. 2022)	12365 (Feb. 2023)	11307.5	IS:3025 (P-45)
13	Potassium As K	mg/L	378 (Oct. 2022)	1122 (Mar. 2023)	756.2	IS:3025 (P-45)
14	Nitrite	mg/L	0.20 (Mar. 2023)	0.60 (Jan. 2023)	0.42	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.064 (Jan. 2023)	0.08 (Dec. 2022)	0.072	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	40321 (Jan. 2023)	46650 (Nov. 2022)	44485.5	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 ML	39 (Feb. 2023)	349 (Oct. 2022)	194.3	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Oil Dock Arm (Diaphragm Jetty)-1m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	-	7.75 (Feb. 2023)	8.01 (Dec. 2022)	7.88	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	844 (Mar. 2023)	2510 (Dec. 2022)	1677.2	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	30314 (Jan. 2023)	43549 (Dec. 2022)	41431	IS:3025 (P-16)
4	Turbidity	NTU	5.0 (Dec. 2022)	5.7 (Jan. 2023)	5.35	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.136 (Jan. 2023)	0.71 (Nov. 2022)	0.432	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	740 (Dec. 2022)	1457 (Nov. 2022)	1098.5	IS:3025 (P-48)
7	Sulphates As SO ₄	mg/L	554.9 (Mar. 2023)	854.91 (Jan. 2023)	704.93	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	2.1 (Oct. 2022)	3.3 (Mar. 2023)	2.72	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.020 (Nov. 2022)	0.10 (Mar. 2023)	0.06	APHA 23rd Ed
11	Calcium As Ca	mg/L	328 (Oct. 2022)	1513 (Dec. 2022)	920.5	IS:3025 (P-40)
12	Sodium As Na	mg/L	8650 (Feb. 2023)	11943 (Jan. 2023)	10396.5	IS:3025 (P-45)
13	Potassium As K	mg/L	356 (Nov. 2022)	550 (Mar. 2023)	453.3	IS:3025 (P-46)
14	Nitrite	mg/L	0.04 (Mar. 2023)	0.42 (Jan. 2023)	0.23	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.05 (Feb. 2023)	0.22 (Dec. 2022)	0.135	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	42396 (Feb. 2023)	49259 (Dec. 2022)	45827.5	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 ML	5 (Jan. 2023)	345 (Nov. 2022)	174.83	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Oil Dock Arm (Diaphragm Jetty)-10 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	-	7.93 (Oct. 2022)	8.05 (Mar. 2023)	7.98	IS:3025 (P-11)
2	Total Suspended Solids,	mg/L	750 (Feb. 2023)	2569 (Dec. 2022)	1859.5	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	38148 (Jan. 2023)	43630 (Mar. 2023)	40889.12	IS:3025 (P-16)
4	Turbidity	NTU	5.2 (Dec. 2023)	6.3 (Mar 2023)	5.88	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.136 (Jan. 2023)	0.71 (Dec. 2022)	0.42	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	642 (Dec. 2022)	1491 (Nov. 2022)	1066.5	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	569.3 (Mar. 2023)	846.30 (Jan. 2023)	707.85	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-36)
9	Dissolved Oxygen	mg/L	2.0 (Nov. 2022)	2.8 (Mar. 2023)	2.46	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.006 (Jan. 2023)	0.15 (Mar. 2023)	0.078	APHA 23rd Ed.
11	Calcium As Ca	mg/L	352 (Oct. 2022)	1597 (Dec. 2022)	974.5	IS:3025 (P-40)
12	Sodium As Na	mg/L	9142 (Mar. 2023)	11632 (Jan. 2023)	10387.33	IS:3025 (P-45)
13	Potassium As K	mg/L	398 (Oct. 2022)	690 (Mar. 2023)	544	IS:3025 (P-45)
14	Nitrite	mg/L	0.09 (Mar. 2023)	0.50 (Jan. 2023)	0.295	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.04 (Feb. 2023)	0.14 (Dec. 2022)	0.09	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	40613 (Feb. 2023)	48793 (Dec. 2022)	44703.6	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 ML	17 (Jan. 2023)	310 (Oct. 2022)	174.3	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Oil Dock Arm (Diaphragm Jetty)-20 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	-	7.45 (Jan. 2023)	8.18 (Mar. 2023)	7.81	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	868 (Mar. 2023)	2415 (Dec. 2022)	1640.5	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	37778 (Jan. 2023)	43644 (Dec. 2022)	40711.6	IS:3025 (P-16)
4	Turbidity	NTU	5.6 (Oct. 2022)	6.3 (Feb. 2023)	5.95	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.124 (Jan. 2023)	0.71 (Dec. 2022)	0.41	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	593 (Dec. 2022)	1390 (Nov. 2022)	991.5	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	560 (Nov. 2022)	847.26 (Jan. 2023)	703.63	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	2.0 (Oct. 2022)	2.7 (Jan. 2023)	2.35	IS:3025 (P-36)
10	Iron As Fe	mg/L	0.040 (Nov. 2022)	0.15 (Mar. 2023)	0.095	APHA 23rd Ed.
11	Calcium As Ca	mg/L	352 (Oct. 2022)	1473 (Dec. 2022)	912.5	IS:3025 (P-40)
12	Sodium As Na	mg/L	9536 (Mar. 2023)	11321 (Jan. 2023)	10428.5	IS:3025 (P-45)
13	Potassium As K	mg/L	406 (Oct. 2022)	720 (Mar. 2023)	563	IS:3025 (P-45)
14	Nitrite	mg/L	0.10 (Mar. 2023)	0.70 (Jan. 2023)	0.40	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.035 (Feb. 2023)	0.12 (Dec. 2022)	0.0775	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-38)
17	Total Solids	mg/L	39640 (Feb. 2023)	48978 (Dec. 2022)	44458.21	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 ML	33 (Jan. 2023)	270 (Dec. 2022)	151.5	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur, Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023 SUMMARY

Sr. No.	Parameters	Unit	Lagoon Area (Turning Circle)-1m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	-	7.80 (Feb. 2023)	8.05 (Dec. 2022)	7.925	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	638 (Mar. 2023)	2610 (Dec. 2022)	1724	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	33475 (Feb. 2023)	46930 (Dec. 2022)	4020.25	IS:3025 (P-18)
4	Turbidity	NTU	4.8 (Dec. 2022)	5.8 (Mar. 2023)	5.3	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.037 (Mar. 2023)	0.82 (Dec. 2022)	0.428	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	610 (Dec. 2022)	1401 (Nov. 2022)	1005.6	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	548.3 (Mar. 2023)	648.30 (Jan. 2023)	696.3	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	2.0 (Dec. 2022)	3.0 (Mar. 2023)	2.54	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.029 (Oct. 2022)	0.25 (Mar. 2023)	0.163	APHA 23rd Ed.
11	Calcium As Ca	mg/L	328 (Oct. 2022)	1501 (Dec. 2022)	914.5	IS:3025 (P-40)
12	Sodium As Na	mg/L	8850 (Mar. 2023)	11695 (Jan. 2023)	10271.5	IS:3025 (P-45)
13	Potassium As K	mg/L	320 (Oct. 2022)	500 (Dec. 2022)	410	IS:3025 (P-43)
14	Nitrite	mg/L	0.01 (Mar. 2023)	0.03 (Dec. 2022)	0.17	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.06 (Feb. 2023)	0.20 (Dec. 2022)	0.14	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	35390 (Feb. 2023)	49440 (Dec. 2022)	42169.5	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 ml	5 (Jan. 2023)	295 (Dec. 2022)	150	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur, Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Lagoon Area (Turning Circle)-10 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH	-	7.95 (Feb. 2023)	8.10 (Dec. 2022)	8.02	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	843 (Mar. 2023)	2590 (Dec. 2022)	1716.0	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	35460 (Feb. 2023)	43920 (Dec. 2022)	39690	IS:3025 (P-16)
4	Turbidity	NTU	4.9 (Dec. 2022)	5.5 (Oct. 2022)	5.25	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.13 (Jan. 2023)	0.84 (Feb. 2023)	0.48	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	675 (Dec. 2022)	1399 (Nov. 2022)	1037	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	560 (Feb. 2023)	844.38 (Jan. 2023)	702.19	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-38)
9	Dissolved Oxygen	mg/L	2.1 (Oct. 2022)	2.8 (Jan. 2023)	2.45	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.03 (Dec. 2022)	0.40 (Feb. 2023)	0.215	APHA 23rd Ed.
11	Calcium As Ca	mg/L	336 (Oct. 2022)	1496 (Dec. 2022)	916.6	IS:3025 (P-40)
12	Sodium As Na	mg/L	9120 (Mar. 2023)	11421 (Jan. 2023)	10270.5	IS:3025 (P-45)
13	Potassium As K	mg/L	336 (Oct. 2022)	666 (Mar. 2023)	501.3	IS:3025 (P-45)
14	Nitrite	mg/L	0.07 (Feb. 2023)	0.50 (Jan. 2023)	0.285	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.06 (Feb. 2023)	0.19 (Dec. 2022)	0.125	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	36498 (Feb. 2023)	47849 (Dec. 2022)	42173.5	IS:3025 (P-19)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 ml	14 (Jan. 2023)	257 (Oct. 2022)	139.6	IS:1622



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur ,Mangalore -575010

Sample Description: Marine Water

Sample Drawn By: Nitya Laboratories

RESULT OF MARINE WATER FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Parameters	Unit	Lagoon Area (Turning Circle)-20 m Below Surface			Protocol
			Minimum	Maximum	Average	
1	pH		7.44 (Jan. 2023)	8.13 (Dec. 2022)	7.78	IS:3025 (P-11)
2	Total Suspended Solids	mg/L	874 (Mar. 2023)	2410 (Dec. 2022)	1542	IS:3025 (P-17)
3	Total Dissolved Solids	mg/L	36750 (Feb. 2023)	44624 (Mar. 2023)	40696	IS:3025 (P-16)
4	Turbidity	NTU	5.3 (Dec. 2022)	5.9 (Mar. 2023)	5.6	IS:3025 (P-10)
5	Nitrate As NO ₃	mg/L	0.124 (Jan. 2023)	0.95 (Feb. 2023)	0.55	IS:3025 (P-34)
6	Magnesium As Mg	mg/L	680 (Dec. 2022)	1396 (Nov. 2022)	1038.6	IS:3025 (P-46)
7	Sulphates As SO ₄	mg/L	580 (Feb. 2023)	851.52 (Jan. 2023)	715.76	IS:3025 (P-24)
8	Oil & Grease	mg/L	ND	ND	ND	IS:3025 (P-39)
9	Dissolved Oxygen	mg/L	2.0 (Jan. 2023)	2.7 (Jan. 2023)	2.36	IS:3025 (P-38)
10	Iron As Fe	mg/L	0.04 (Dec. 2022)	0.55 (Mar. 2023)	0.296	APHA 23rd Ed.
11	Calcium As Ca	mg/L	344 (Oct. 2022)	1470 (Dec. 2022)	907	IS:3025 (P-40)
12	Sodium As Na	mg/L	9651 (Mar. 2023)	11394 (Jan. 2023)	10522.5	IS:3025 (P-45)
13	Potassium As K	mg/L	388 (Oct. 2022)	580 (Mar. 2023)	484	IS:3025 (P-45)
14	Nitrite	mg/L	0.09 (Feb. 2023)	0.70 (Jan. 2023)	0.396	IS:3025 (P-34)
15	Phosphate As P	mg/L	0.05 (Feb. 2023)	0.12 (Dec. 2022)	0.085	IS:3025 (P-31)
16	Silica As SiO ₂	mg/L	ND	ND	ND	IS:3025 (P-35)
17	Total Solids	mg/L	37940 (Feb. 2023)	47910 (Dec. 2022)	42925	IS:3025 (P-15)
18	Total Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-34)
19	Organic Nitrogen	mg/L	ND	ND	ND	IS:3025 (P-11)
20	Faecal Coliform	MPN/100 ML	14 (Feb. 2023)	310 (Oct. 2022)	162	IS:1622



1.0 Introduction

2.0 Compliance

3.0 Environmental Monitoring

4.0 Air Quality Monitoring

5.0 Water Quality Monitoring

6.0 Noise Monitoring

7.0 Vibration Monitoring

8.0 Soil Monitoring

9.0 Sediment Monitoring

10.0 Biological Monitoring

11.0 Socio-Economic Monitoring

12.0 Stakeholder Engagement

13.0 Summary

14.0 Annexure

15.0 References

16.0 Appendix

STACK EMISSION MONITORING

1.1. Introduction

The following table provides details of the monitoring stations for the monitoring of air quality parameters and pollutants at the various locations as per the approved plan.

1.2. Monitoring

The air quality monitoring is carried out at the various locations as per the approved plan. The monitoring is carried out at the various locations as per the approved plan. The monitoring is carried out at the various locations as per the approved plan.

- 1.3. Monitoring Stations
- 1.3.1. Station 1
- 1.3.2. Station 2
- 1.3.3. Station 3
- 1.3.4. Station 4
- 1.3.5. Station 5
- 1.3.6. Station 6
- 1.3.7. Station 7
- 1.3.8. Station 8
- 1.3.9. Station 9
- 1.3.10. Station 10
- 1.3.11. Station 11
- 1.3.12. Station 12
- 1.3.13. Station 13
- 1.3.14. Station 14
- 1.3.15. Station 15
- 1.3.16. Station 16
- 1.3.17. Station 17
- 1.3.18. Station 18
- 1.3.19. Station 19
- 1.3.20. Station 20



7.0 Stack Emission Monitoring

7.1 Sampling Location

The Nitya Laboratories team in consultation with the Engineer In-charge of New Mangalore Port Authority, Paradip fixed the frequency and number of sampling stations. Accordingly, a flue gas monitoring was conducted at 12 locations during the period from October 2021 to March 2022.

Table - 7
Location of Stack Emission Stations

Sr. No.	Location of Station	Frequency
1.	DG Set of Signal Station	Once in a Month
2.	DG Set of 500 KVA of Electrical Substation DG-1	Once in a Month
3.	DG-1 Set of 33 KVA Main of Capacity 1000 KVA	Once in a Month
4.	DG-2 Set of 33 KVA Main of Capacity 1000 KVA	Once in a Month
5.	DG Set of 500 KVA of Electrical Substation DG-2	Once in a Month
6.	DG Set of 160 KVA at Hospital	Once in a Month
7.	DG Set of 50 KVA of ADM Building	Once in a Month
8.	Oily Jetty Pump-2 of Capacity 890 HP	Once in a Month
9.	Oily Jetty Pump-1 of Capacity 890 HP	Once in a Month
10.	Oily Jetty Pump-3 of Capacity 890 HP	Once in a Month
11.	Hydrant Pump of Capacity 450HP	Once in a Month
12.	Monitor Pump	Once in a Month

7.2 Results

The observations made on drinking water sampling at 12 locations have been presented through Table-2. Minimum and maximum values and arithmetic mean values of the 24-hour average concentrations have also been computed and presented.

7.3 Methodology

Day to day increasing industrialization in creating most critical global problem i.e., Air pollution. Many type of industries including thermal power station, cement plant, refineries, pulp and paper industries etc emitted so many types of pollutant in atmosphere monitor flue gas emission from stationary source. Monitoring of stack and vent emission is now becoming a routine requirement not only for large but even the medium and small industrial units.

7.4 Instrument / Accessories:

- 1) Panel Box Assembly
- 2) Vacuum pump
- 3) Dry gas meter
- 4) Cold box assembly
- 5) Pitot tube
- 6) Impingers
- 7) Nozzels
- 8) Sampling pobe
- 9) Inter connection tubings
- 10) Thimble holder
- 11) Pre-weighted Thimble
- 12) Red oil
- 13) Distilled water



- 14) Extension cord
- 15) Thermocouple
- 16) Syringes
- 17) Tool kit
- 18) Instruction manual or SOP
- 19) Filled data sheet
- 20) Hand globs

7.4.1 Preparation

Sampling port and port hole should be at specified height as specified by Central Pollution Control Board Height of sampling port should be less than the length of vacuum hose if required increase length of vacuum hose (maximum 40 meter recommended by manufacturer). Thimble must be pre-weighted according. Depending upon the parameter required absorbing solution.

7.4.2 Assembling

Before attempting stack monitoring it is necessary to assemble all parts of stack monitoring unit that should be properly assembled as per manufacture instruction.

7.4.3 Procedure

7.4.3.1 Temperature measurement

1. Connect the thermocouple lead to panel box assemble by inserting the dual plug.
2. Switch on the pyrometer to note down the ambient temperature
3. Insert thermocouple sensor into the stack through the hole provided on the stack.
4. Allow temperature to stabilize for 10 minutes then read the on the pyrometer.
5. Remove the thermocouple from the stack hole.

7.4.3.2 Velocity Measurement

Digital manometer to measure the velocity of air – stream inside the chimney or duct. The Pitot tube inserted into a stack develops a differential pressure proportional to the kinetic head of the smoke-stream.

$$\text{Velocity of Gases } V = K \sqrt{H X T_s}$$

7.4.3.3. Sampling for SPM and Gaseous Pollutant

Loading of thimble in thimble holder Open the thimble holder by unscrewing the front end Push the thimble (open end) on the conical surface. Slip the thimble slightly inverse Tighten the screw keeping the thimble straight. Keep on tightening till the edge of thimble strikes against back surface.

$$\text{Isokinetic Flow Rate } Q_s = \frac{V \cdot A_n \cdot 60 \cdot 1000 \cdot (273 + 25)}{T_s}$$

Q_s	=	Isokinetic Flow Rate
V	=	Velocity of stack gas
A_n	=	Area of nozzle
T_s	=	Stack Temperature

There are three nozzles of $\frac{1}{4}$ and $\frac{1}{2}$ and $\frac{3}{8}$ ". The nozzle is to be selected in such a way so that Q_s fall within the range of 60 LPM rotameter. Connect the filter holder nozzle and probe pipe in such a way that handle provided on the probe pipe must be oriented so that it indicates the direction, nozzle is facing in the same direction. Connect the vacuum pump to panel box assembly and switch on.

Set an appropriate flow for gaseous sampling on the 3 LPM flow meter. Gaseous sampling rate should be between 1 to 2 LPM. Subtract the gaseous sampling rate from the iso-kinetic sampling rate and the balance set on 60 LPM flow meter. Flow for PM should always be adjusted after the flow adjusted for gaseous sampling.



Pressure switch knob can be use for determination of pressure drop at the metering point by turning the knob towards PM and gas side. The corresponding redoubt is given on the vacuum gauge.

Calculation

$$\text{Volume of air sampled } Q_m \text{ (lit)} = \frac{Q_s * (740 - P_m)}{760} * \frac{298 * t}{273 + T_a}$$

$$\text{PM (mg/Nm}^3\text{)} = \frac{W_2 - W_1 * 10^6}{Q_m}$$



7.5 Results & Discussion on Observations**DG Set of Signal Station**

At this location Particulate Matter as PM was found between 0.112 to 0.216 g/kw-hr. The Value of Oxide of Nitrogen as NO_x was found between 1.262 to 2.091 g/kw-hr. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

DG Set of 500 KVA of Electrical Substation DG-1

At this location Particulate Matter as PM was found between 0.104 to 0.201 g/kw-hr. The Value of Oxide of Nitrogen as NO_x was found between 0.637 to 1.271 g/kw-hr. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

DG-1 Set of 33 KVA Main of Capacity 1000 KVA

At this location Particulate Matter as PM was found between 0.107 to 0.198 g/kw-hr. The Value of Oxide of Nitrogen as NO_x was found between 1.012 to 1.928 g/kw-hr. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

DG-2 Set of 33 KVA Main of Capacity 1000 KVA

At this location Particulate Matter as PM was found between 0.118 to 0.202 g/kw-hr. The Value of Oxide of Nitrogen as NO_x was found between 2.027 to 2.927 g/kw-hr. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

DGSet of 500 KVA of Electrical Substation DG-2

At this location Particulate Matter as PM was found between 0.123 to 0.231 g/kw-hr. The Value of Oxide of Nitrogen as NO_x was found between 1.102 to 1.927 g/kw-hr. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

DGSet of 160 KVA at Hospital

At this location Particulate Matter as PM was found between 0.103 to 0.137 g/kw-hr. The Value of Oxide of Nitrogen as NO_x was found between 1.291 to 2.192 g/kw-hr. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

DGSet of 50 KVA ADM Building

At this location Particulate Matter as PM was only found between in month of Dec, 0.102 g/kw-hr. The Value of Oxide of Nitrogen as NO_x was found between 2.127 to 3.029 g/kw-hr. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

Oily Jetty Pump-2 of Capacity 890 HP

At this location Particulate Matter as PM was found between 54.2 to 76.2mg/Nm³. The Value of Oxide of Nitrogen as NO_x was found between 124 to 2268 mg/Nm³. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

Oily Jetty Pump-1 of Capacity 890 HP

At this location Particulate Matter as PM was found between 45.2 to 62.4 mg/Nm³. The Value of Oxide of Nitrogen as NO_x was found between 116 to 2083 mg/Nm³. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

Oily Jetty Pump-3 of Capacity 890 HP

At this location Particulate Matter as PM was found between 52.1 to 87.2 mg/Nm³. The Value of Oxide of Nitrogen as NO_x was found between 102 to 2060 mg/Nm³. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

Hydrant Pump of Capacity 450 HP

At this location Particulate Matter as PM was found between 74.4 to 91.2 mg/Nm³. The Value of Oxide of Nitrogen as NO_x was found between 131 to 2779 mg/Nm³. The Value of Oxide of Sulphur as SO_x was absent during the analysis.



Monitor Pump

At this location Particulate Matter as PM was found between 55.4 to 64.3 mg/Nm³. The Value of Oxide of Nitrogen as NO_x was found between 87 to 2418 mg/Nm³. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

Oily Jetty Pump-3 of Capacity 890 HP(Monitor Pump)

At this location Particulate Matter as PM was found between 57.89 to 74.5 mg/Nm³. The Value of Oxide of Nitrogen as NO_x was found between 112 to 1749 mg/Nm³. The Value of Oxide of Sulphur as SO_x was absent during the analysis.

Sl. No.	Parameter	Unit	Value
1	Particulate Matter (PM)	mg/Nm ³	55.4 to 64.3
2	Oxide of Nitrogen (NO _x)	mg/Nm ³	87 to 2418
3	Oxide of Sulphur (SO _x)	mg/Nm ³	Absent
4	Particulate Matter (PM)	mg/Nm ³	57.89 to 74.5
5	Oxide of Nitrogen (NO _x)	mg/Nm ³	112 to 1749
6	Oxide of Sulphur (SO _x)	mg/Nm ³	Absent



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	DG Set of Signal Station	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	0.112 (Dec. 2022)	0.216 (Oct. 2022)	0.164
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	1.262 (Jan. 2023)	2.019 (Mar. 2023)	1.640
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	DG Set of 500 KVA of Electrical Substation DG-1	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	0.104 (Dec. 2022)	0.201 (Feb. 2023)	0.152
2	Oxide of Nitrogen as NO _x (g/kw-hr)	0.637 (Dec. 2022)	1.271 (Mar. 2023)	0.954
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	DG-1 Set of 33 KVA Main of Capacity 1000 KVA	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	0.107 (Jan. 2023)	0.198 (Oct. 2022)	0.152
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	1.012 (Feb. 2023)	1.928 (Oct. 2022)	1.476
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023 SUMMARY

Sr. No.	DG-2 Set of 33 KVA Main of Capacity 1000 KVA	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	0.118 (Jan. 2023)	0.202 (Oct. 2022)	0.160
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	2.027 (Nov. 2022)	2.927 (Mar. 2023)	2.477
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	DG Set of 500 KVA of Electrical Substation DG-2	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	0.123 (Feb. 2023)	0.231 (Mar. 2023)	0.177
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	1.102 (Dec. 2022)	1.927 (Mar. 2023)	1.514
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	DG Set of 160 KVA at Hospital	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	0.103 (Feb. 2023)	0.137 (Nov. 2022)	0.120
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	1.291 (Dec. 2022)	2.192 (Mar. 2023)	1.741
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023 SUMMARY

Sr. No.	DG Set of 50 KVA of ADM Building	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (g/kw-hr)	ND	ND	ND
2	Oxide of Nitrogen (as NO _x) (g/kw-hr)	2.127 (Dec. 2022)	3.029 (Mar. 2023)	2.578
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND

Particulate Matter, (as PM), (g/kw-hr) is only Found in Month of Dec-22 for this Particular location and Value is 0.102.



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023 SUMMARY

Sr. No.	Oily Jetty Pump-2 of Capacity 890 HP	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (mg/Nm ³)	52.4 (Mar. 2023)	78.2 (Nov. 2022)	64.3
2	Oxide of Nitrogen (as NO _x) (mg/Nm ³)	124 (Oct. 2022)	2268 (Jan. 2023)	1196
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Oily Jetty Pump-1 of Capacity 890 HP	Minimum	Maximum	Average
1	Particulate Matter, (as PM),(mg/Nm ³)	45.2 (Feb. 2023)	62.4 (Jan. 2023)	53.8
2	Oxide of Nitrogen (as NO _x)(mg/Nm ³)	116 (Oct. 2022)	2083 (Jan. 2023)	1099.5
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Oily Jetty Pump-3 of Capacity 890 HP	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (mg/Nm ³)	52.1 (Oct. 2022)	87.2 (Jan. 2023)	69.5
2	Oxide of Nitrogen (as NO _x) (mg/Nm ³)	102 (Dec. 2022)	2060 (Jan. 2023)	1081
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023 SUMMARY

Sr. No.	Hydrant Pump of Capacity 450HP	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (mg/Nm ³)	74.4 (Jan. 2023)	91.2 (Oct. 2022)	82.8
2	Oxide of Nitrogen (as NO _x) (mg/Nm ³)	131 (Oct. 2022)	2779 (Jan. 2023)	1455
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Monitor Pump	Minimum	Maximum	Average
1	Particulate Matter, (as PM),(mg/Nm ³)	55.4 (Feb. 2023)	64.3 (Nov. 2022)	59.85
2	Oxide of Nitrogen (as NO _x) (mg/Nm ³)	87 (Oct. 2022)	2418 (Jan. 2023)	1252.5
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur , Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

STACK EMISSION MONITORING FOR SIX MONTHS OCTOBER 2022 TO MARCH 2023SUMMARY

Sr. No.	Oily Jetty Pump-3 of Capacity 890 HP (Monitor Pump)	Minimum	Maximum	Average
1	Particulate Matter, (as PM), (mg/Nm ³)	57.69 (Oct. 2022)	74.5 (Feb. 2023)	66.09
2	Oxide of Nitrogen (as NO _x) (mg/Nm ³)	112 (Dec. 2022)	1749 (Jan. 2023)	930
3	Oxides of Sulphur (as SO _x) (mg/Nm ³)	ND	ND	ND



Test Report

Name Of the Client: New Mangalore Port Authority

Address Of The Client: Panambur, Mangalore -575010

Sample Description: Stack Emission

Sample Drawn By: Nitya Laboratories

Test Results of March Month 2023

Sr. No.	Stack Particulars	Date of Sampling	Ambient Temp. (°C)	Stack Temp. (°C)	Aveg. Gas Velocity (m/s)	Particulate Matter, (as PM ₁₀), (mg/Nm ³)	
1	Oily Jetty Pump-1 of Capacity 890 HP-Hydrant	28/03/2023	33	245	11.13	52.4	
2	Oily Jetty Pump-1 of Capacity 890 HP-Monitor	28/03/2023	33	456	14.27	91.6	
3	Oily Jetty Pump-2 of Capacity 890 HP-Hydrant	28/03/2023	34	298	12.08	67.9	
4	Oily Jetty Pump-2 of Capacity 890 HP-Monitor	28/03/2023	34	303	12.04	72.4	
5	Oily Jetty Pump-3 of Capacity 890 HP	29/03/2023	34	297	11.77	56.2	
6	Oily Jetty Pump-3 of Capacity 890 HP of Monitor Pump	29/03/2023	33	427	12.75	76.6	
Permissible Limits as per CPCB (mg/Nm ³)						150	
Test Method						IS-11265 (P-1)	
Sr. No.	Stack Particulars	Date of Sampling	Ambient Temp. (°C)	Stack Temp. (°C)	Aveg. Gas Velocity (m/s)	Oxide of Nitrogen (as NO _x) (mg/Nm ³)	Oxides of Sulphur (as SO _x) (mg/Nm ³)
1	Oily Jetty Pump-1 of Capacity 890 HP-Hydrant	28/03/2023	33	245	11.13	163	ND (DL-1.0)
2	Oily Jetty Pump-1 of Capacity 890 HP-Monitor	28/03/2023	33	456	14.27	194	ND (DL-1.0)
3	Oily Jetty Pump-2 of Capacity 890 HP-Hydrant	28/03/2023	34	298	12.08	139	ND (DL-1.0)
4	Oily Jetty Pump-2 of Capacity 890 HP-Monitor	28/03/2023	34	303	12.04	147	ND (DL-1.0)
5	Oily Jetty Pump-3 of Capacity 890 HP	29/03/2023	34	297	11.77	112	ND (DL-1.0)
6	Oily Jetty Pump-3 of Capacity 890 HP of Monitor Pump	29/03/2023	33	427	12.75	125	ND (DL-1.0)

