



ನವ ಮಂಗಳೂರು ಬಂದರು ಮಂಡಳಿ

ನವ ಮಂಗಲೂರು ಪತ್ತನ ನ್ಯಾಸ

**NEW MANGALORE PORT TRUST**

ಭಾರತ ಸರಕಾರ (ಪತ್ತನ, ಪಾತ್ರ ಪರಿವಹನ ಔರ ಜಲಮಾರ್ಗ ಮಂತ್ರಾಲಯ")

**Govt of India (Ministry of Ports, Shipping and Waterways)**

ಪಣಂಬೂರು ಪಣಂಬೂರು Panambur / ಮಂಗಳೂರು ಮಂಗಲೂರು Mangalore - 575 010



3/11/EMP/CE(C)/2020-21/TS/07

14-12-2021

To:

K.P.SINGH

Regional Officer

Ministry of Environment & Forests,

Regional Office (South Zone), 4<sup>th</sup> Floor, E&F Wings,

KendriyaSadan, 17<sup>th</sup> Main Road, II Block,

Koramangala,

BANGALORE – 560 034.

Sir,

Sub: Submission of half yearly Compliance report from April 2021 to September 2021-2021 -Environmental Clearance issued by the Ministry of Environment Forests & Climate for Berth No.18-reg

Ref: EC F.NO.11-2/2010-IA,III dated 19-09-2011

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With reference to the subject cited above, the submission of six monthly compliance report along with monitoring data of test results on water samples, air samples and Noise level for the period from April 2021-September 2021 is enclosed here with for information please. The same information has been sent through email to rosz.bng-mef@nic.in and roszman@yahoo.in on

The half yearly Compliance report from April 2021 to September 2021 is uploaded in Port website [www.newmangaloreport.gov.in](http://www.newmangaloreport.gov.in)

Thanking you,

Yours faithfully,

Encl: As above

Chief Engineer (Civil)

Copy to

1. Environmental Officer, Karnataka State Pollution Control Board, "Parisara Bhavan", 10B, Baikampady, Mangalore -575010
2. CPCB , Zonal office, 1<sup>st</sup> &2<sup>nd</sup> floors, Nisarga Bhavan, A Block, Thimmaiah Main Road, 7<sup>th</sup> D Cross, Shivanagar, Bangalore. Sent through email- cpcbszo@yahoo.com

ದೂರವಾಣಿ : ಕಳೆ 0824 -2407341

ফೋನ್ : 0824- 2408390

फोನ : कार्यालय : 0824 - 2407341

फेक्स : 0824 - 2408390

Phone : Office : 2407341 (18 Lines)

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An ISO 9001:2015, 14001:2015 & ISPS Compliant Port

Revised stipulated environmental clearances report as per the Letter No. F.No.11-  
2/2010-IA.III (Pt.)Dated:-14<sup>th</sup> December 2016

Sl.No.	Specific Conditions:	Remarks
1	Construction activity shall be carried out strictly according to the provisions of CRZ Notification, 2011. No construction work other than those permitted in Coastal Regulation Zone Notification shall be carried out in Coastal Regulation Zone area.	Complied
2	All the recommendations and conditions specified by Karnataka Coastal Zone Management Authority (KCZMA) vide letter no. FEE 580 CRZ 2015 dated 07.01.2016 shall be complied with.	Complied. (Annexure -I)
3	As proposed, a fully mechanised coal unloading system shall be provided for Berth 18. Air pollution control measures to be provided are water sprinklers; closed conveyor, bag filter and mechanised cargo handling.	Complied.
4	Automatic / online monitoring system (24 x 7) monitoring devices for air pollution as well as water pollution in respect of flow measurement and relevant pollutants in the treatment system shall be installed. The data should be made available to the respective SPCB and in the Company's website.	Regular Air & Water quality sample testing shall be conducted till the Installation of Online monitoring system 24X7 and all efforts are made to install it in time frame of 06months. Flow measurement is installed for relevant Water pollution pollutants in the treatment system.
5	All the recommendations mentioned in the rapid risk assessment report, disaster management plan and safety guidelines shall be implemented.	Implemented
6	All other conditions will remain unchanged.	Accepted

**ANNEXURE-I**

<b>Berth No. 18 Environment conditions</b>		
<b>Sl. No</b>	<b>Specific Conditions</b>	<b>Remarks</b>
1	"Consent for Establishment" shall be obtained from State Pollution Control Board under Air and Water Act and a copy shall be submitted to the Ministry before start of any construction work at the site.	Obtained. Valid up to 5 year from 23/05/2014  Consent for Operation valid upto 22-06-2022
2	The authenticate map of the HTL/LTL together with their respective coordinates at discrete intervals shall be submitted so as to identify them later on the ground if and when necessary.	Submitted to MOEF on 08.12.2014
3	The project shall be executed in such a manner that there shall not be any disturbance to the fishing activity.	The Project is taken up within the security compound of the operating Port. Hence the fishing activity is not affected during the course of execution of the project.
4	It shall be ensured that there is no displacement of people, houses or fishing activity as a result of the project.	The Project is taken up within the security compound of the operating Port. Hence there is no displacement of people, houses or fishing activity during the course of execution of the project.  Total land of the Port: 2290 acres  Total Green belt of the port : 734 acres No vacant land available in the port.
5	No construction work other than those permitted in Coastal Regulation Zone Notification shall be carried out in Coastal	Constructed as per CRZ II

	Regulation Zone area.	
6	The project proponent shall set up separate environmental management cell for effective implementation of the stipulated environmental safeguards under the supervision of a Senior Executive.	Environmental cell headed by the Environmental Officer under the supervision of Chief Engineer Civil for effective implementation of the stipulated environmental safeguards has been setup.
7	The funds earmarked for environment management plan shall be included in the budget and this shall not be diverted for any other purposes.	An amount of Rs 50 lakhs towards Fire fighting and environmental mitigation measures and Rs 80 lakhs towards Environmental and social concern has been earmarked in the Estimate.
<b>General conditions</b>		
1	Appropriate measures must be taken while undertaking digging activities to avoid any likely degradation of water quality.	<p>The excavated material and the bore muck shall be disposed at designated areas away from the Sea/water bodies.</p> <p>The dredged material has been dumped at the designated dumping ground suggested by the CWPRS.</p>
2	Full support shall be extended to the officers of this Ministry/Regional Office at Bangalore by the project proponent during inspection of the project for monitoring purposes by furnishing full details and action plan including action taken reports in respect of mitigation measures and other environmental protection activities.	Full support and cooperation will be extended to the officers of Ministry/Regional Office.
3	A six-monthly monitoring report shall need to be submitted by the project proponents to the Regional Office of this Ministry at Bangalore regarding the implementation of	Complied Statement of Monitoring report of Air, water, Noise, from April 2021 to Sep 2021

	the stipulated conditions	
4	Ministry of Environment & Forests or any other competent authority may stipulate any additional conditions or modify the existing ones, if necessary in the interest of environment and the same shall be complied with.	No additional conditions stipulated
5	The Ministry reserves the right to revoke this clearance if any of the conditions stipulated are not complied with the satisfaction of the Ministry.	Complying with all the stipulations
6	In the event of a change in project profile or change in the implementation agency, a fresh reference shall be made to the Ministry of Environment and Forests.	Complied
7	The project proponents shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of land development work.	Project Completed on 31.08.2016.
8	A copy of the clearance letter shall be marked to concerned Panchayat/local NGO, if any, from whom any suggestion/ representation has been made/ received while processing the proposal.	At the time of construction informed
9	Karnataka Pollution Control Board shall display a copy of the clearance letter at the Regional Office, District Industries Center and Collector's Office/Tahsildar's office for 30 days.	N.A
10	These stipulations would be enforced among others under the provisions of water ( Preservation and Control of Pollution) Act 1974, the Air( Preservation and Control of Pollution) Act, 1981, the Environment (Protection) Act 1986 , the Public liability (Insurance Act,1991 and EIA notification	Complied

	1994, including the amendments and rules made thereafter.	
11	All other statutory clearances such as the approvals for storage of diesel from Chief controller of Explosives, Fire department, Civil Aviation department , Forest Conservation Act, 1980 and wild life(protection) Act,1972 etc. shall be obtained, as applicable by project proponents from the respective competent authorities.	Obtained
12	The project proponent shall advertise in at least two local Newspapers widely circulated in the region, one of which shall be in the vernacular language informing that the project has been accorded Environmental Clearance and copies of clearance letters are available with the state Pollution Control Board and may also be seen on the website of the ministry MOEF at <a href="http://www.envfor.nic.in">http://www.envfor.nic.in</a>	Paper advertisement was given in Udayavani, Manipal and Deccan Herald, Mangalore dated 29.09.2011
13	Environmental clearances is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation vs. Union of India in Writ Petition (Civil) No.460 of 2004 as may be applicable to this project.	Complied
14	Status of Compliance to the various stipulated environmental conditions and environmental safe guards will be uploaded by the project proponent in its website.	Uploaded .www. newmangalore-port.com

15	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zilla Parishad/Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions / representations, if any , were received while Processing the Proposal . The clearance letter shall also be put on the website of the company by the Proponent.	At the time of construction issued
16	The proponent shall upload the status of compliance of the stipulated EC conditions, including results of monitored data on their website and shall upload the same periodically. It shall simultaneously be sent to the Regional office of MoE&CC, the respective Zonal Office of CPCB and the SPCB.	Uploaded in www. newmangalore-port.com
17	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated EC conditions including results of monitored data(both in hard copies as well as by e-mail) to the respective Regional Office of MEF&CC , the respective Zonal Office of CPCB and the SPCB.	Complied Statement of Monitoring report of Air, water, Noise, STP and Stack emission from April 2021 to Sep 2021
18	The environmental statement for each financial year ending 31 <sup>st</sup> March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with status of compliance of EC conditions and shall also be sent to the respective Regional Offices of MOEF&CC by e-mail.	Submitted to KSPCB on 30/09/2021. Soft copy uploaded in the company web site.

# Hubert Enviro Care Systems (P) Ltd.

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in



## Laboratory Services Division

(Chemical & Biological Testing)

Recognized by MoEF, BIS

FSSAI Notified Laboratory

ISO 9001, 14001 & OHSAS 18001 Certified.

## TEST REPORT

Page 1 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	CONTAINER YARD – PROJECT SITE										
Sample Description	AAQ 1: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.05.2021										
Report No	HECS/A/001-009/070521										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

## RESULTS

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni
	μg/m <sup>3</sup>				mg/m <sup>3</sup>	μg/m <sup>3</sup>				ng/m <sup>3</sup>		
01.04.2021	15.9	21.8	48.7	24.3	0.18	BDL	12.4	BDL	BDL	BDL	BDL	BDL
05.04.2021	15.8	20.9	47.5	23.8	0.19	BDL	11.6	BDL	BDL	BDL	BDL	BDL
08.04.2021	16.9	22.1	48.6	23.4	0.25	BDL	11.8	BDL	BDL	BDL	BDL	BDL
12.04.2021	16.4	23.8	49.1	22.9	0.22	BDL	12.3	BDL	BDL	BDL	BDL	BDL
15.04.2021	16.3	24.4	48.2	24.5	0.26	BDL	12.2	BDL	BDL	BDL	BDL	BDL
19.04.2021	17.2	23.7	47.3	25.1	0.31	BDL	12.9	BDL	BDL	BDL	BDL	BDL
22.04.2021	16.7	22.8	48.2	24.8	0.34	BDL	13.2	BDL	BDL	BDL	BDL	BDL
26.04.2021	15.5	23.1	47.6	23.9	0.36	BDL	13.4	BDL	BDL	BDL	BDL	BDL
29.04.2021	16.1	23.4	48.4	23.7	0.29	BDL	12.5	BDL	BDL	BDL	BDL	BDL
Min.	15.5	20.9	47.3	22.9	0.18	BDL	11.6	BDL	BDL	BDL	BDL	BDL
Max.	17.2	24.4	49.1	25.1	0.36	BDL	13.4	BDL	BDL	BDL	BDL	BDL
Avg.	16.3	22.9	48.2	24.0	0.30	BDL	12.5	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80	80	100	60	2**	1*	100**	400*	5***	1***	6***	20***

Note: \*: 24 hours average; \*\*: 8 hours average; \*\*\*: Annual average

### Test Methods Followed:

PM<sub>10</sub> : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)

PM<sub>2.5</sub> : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)

SO<sub>2</sub> : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)

NO<sub>2</sub> : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)

O<sub>3</sub> : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)

NH<sub>3</sub> : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)

CO : IS 5182 (Pt 10): 1999 (RA 2013)

Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)

C<sub>6</sub>H<sub>6</sub> : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)

B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit: PM<sub>2.5</sub>-Particulate matter size less than 2.5 Micron, PM<sub>10</sub>-Particulate matter size less than 10 Micron; SO<sub>2</sub> Sulphur dioxide; NO<sub>2</sub> - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m<sup>3</sup>); O<sub>3</sub>-Ozone(DL 10 μg/m<sup>3</sup>); NH<sub>3</sub>-Ammonia (DL 5 μg/m<sup>3</sup>); Pb-Lead (DL 0.05 μg/m<sup>3</sup>); As-Arsenic (DL 0.1 ng/m<sup>3</sup>); Ni-Nickel (DL 0.5 ng/m<sup>3</sup>); Benzene-(DL 1 μg/m<sup>3</sup>); B(α)P- Benzo -α-pyrene(DL0.1 ng/m<sup>3</sup>); ng/m<sup>3</sup>: nanogram per cubic meter; μg/m<sup>3</sup> - microgram per cubic meter.

## CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

\*\*\*\*\*End of Report \*\*\*\*\*

Laboratory and Quality Manager - Authorized Signatory



1. The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization 2. Samples are not drawn by HECS unless or otherwise mentioned 3. Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report. 4. Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report. 5. The test results relate only to the test items.

HECS/Q/FMT/50

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TC-5786

## Laboratory Services Division

(Chemical & Biological Testing)

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ISO 9001, 14001 & OHSAS 18001 Certified.

### TEST REPORT

Page 2 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	BERTH NO. 14 UP STREAM										
Sample Description	AAQ 2: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.05.2021										
Report No	HECS/A/010-018/070521										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

### RESULTS

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni
	# $\mu\text{g}/\text{m}^3$				mg/m <sup>3</sup>	$\mu\text{g}/\text{m}^3$				ng/m <sup>3</sup>		
01.04.2021	14.4	18.9	47.6	25.6	0.23	BDL	12.2	BDL	BDL	BDL	BDL	BDL
05.04.2021	15.6	17.6	46.5	24.8	0.21	BDL	11.8	BDL	BDL	BDL	BDL	BDL
08.04.2021	14.2	15.8	45.8	25.5	0.28	BDL	12.6	BDL	BDL	BDL	BDL	BDL
12.04.2021	14.6	17.7	46.7	24.3	0.33	BDL	11.7	BDL	BDL	BDL	BDL	BDL
15.04.2021	15.2	18.2*	47.2	23.9	0.25	BDL	12.3	BDL	BDL	BDL	BDL	BDL
19.04.2021	14.9	17.6	46.6	24.4	0.27	BDL	11.8	BDL	BDL	BDL	BDL	BDL
22.04.2021	15.9	19.4	48.3	25.2	0.31	BDL	12.4	BDL	BDL	BDL	BDL	BDL
26.04.2021	16.1	16.8	46.1	24.7	0.36	BDL	13.1	BDL	BDL	BDL	BDL	BDL
29.04.2021	14.3	17.8	47.5	23.8	0.32	BDL	13.3	BDL	BDL	BDL	BDL	BDL
Min.	14.2	15.8	45.8	23.8	0.21	BDL	11.7	BDL	BDL	BDL	BDL	BDL
Max.	16.1	19.4	48.3	25.6	0.36	BDL	13.3	BDL	BDL	BDL	BDL	BDL
Avg.	15.0	17.8	46.9	24.7	0.28	BDL	12.4	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: \* 24 hours average; \*\* 8 hours average; \*\*\* Annual average

#### Test Methods Followed:

- PM<sub>10</sub> : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM<sub>2.5</sub> : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO<sub>2</sub> : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
- NO<sub>2</sub> : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O<sub>3</sub> : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH<sub>3</sub> : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C<sub>6</sub>H<sub>6</sub> : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM<sub>2.5</sub>-Particulate matter size less than 2.5 Micron, PM<sub>10</sub>-Particulate matter size less than 10 Micron; SO<sub>2</sub> Sulphur dioxide; NO<sub>2</sub> - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m<sup>3</sup>); O<sub>3</sub>-Ozone(DL 10  $\mu\text{g}/\text{m}^3$ ); NH<sub>3</sub>-Ammonia (DL 5  $\mu\text{g}/\text{m}^3$ ); Pb-Lead (DL 0.05  $\mu\text{g}/\text{m}^3$ ); As-Arsenic (DL 0.1 ng/m<sup>3</sup>); Ni-Nickel (DL 0.5 ng/m<sup>3</sup>); Benzene-(DL 1  $\mu\text{g}/\text{m}^3$ ); B(α)P- Benzo - $\alpha$ -pyrene(DL0.1 ng/m<sup>3</sup>); ng/m<sup>3</sup>: nanogram per cubic meter;  $\mu\text{g}/\text{m}^3$  - microgram per cubic meter.

### CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

\*\*\*\*\*End of Report \*\*\*\*\*

Laboratory and Quality Manager- Authorized Signatory



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### TEST REPORT

Page 3 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	BERTH NO. 14 DOWN STREAM										
Sample Description	AAQ 3: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.05.2021										
Report No	HECS/A/019-027/070521										
Instruments Used	Envirotech APM 460 brushless RDS. & Envirotech APN 550 mini										

### RESULTS

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni
	μg/m <sup>3</sup>				mg/m <sup>3</sup>	μg/m <sup>3</sup>				ng/m <sup>3</sup>		
01.04.2021	13.9	16.4	43.7	23.8	0.21	BDL	12.8	BDL	BDL	BDL	BDL	BDL
05.04.2021	13.8	17.4	44.6	25.2	0.23	BDL	12.9	BDL	BDL	BDL	BDL	BDL
08.04.2021	14.5	16.9	42.9	24.9	0.19	BDL	13.2	BDL	BDL	BDL	BDL	BDL
12.04.2021	14.2	17.7	44.3	23.7	0.24	BDL	14.0	BDL	BDL	BDL	BDL	BDL
15.04.2021	13.7	19.2	45.1	25.4	0.22	BDL	13.5	BDL	BDL	BDL	BDL	BDL
19.04.2021	13.5	18.4	45.8	26.2	0.31	BDL	13.4	BDL	BDL	BDL	BDL	BDL
22.04.2021	14.8	19.1	43.8	24.6	0.28	BDL	14.1	BDL	BDL	BDL	BDL	BDL
26.04.2021	12.9	18.7	44.6	25.1	0.25	BDL	13.7	BDL	BDL	BDL	BDL	BDL
29.04.2021	13.4	17.3	45.4	26.2	0.32	BDL	13.1	BDL	BDL	BDL	BDL	BDL
Min.	12.9	16.4	42.9	23.7	0.19	BDL	12.8	BDL	BDL	BDL	BDL	BDL
Max.	14.8	19.2	45.8	26.2	0.32	BDL	14.1	BDL	BDL	BDL	BDL	BDL
Avg.	13.9	17.9	44.5	25.0	0.25	BDL	13.4	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: \*: 24 hours average; \*\*: 8 hours average; \*\*\*: Annual average

#### Test Methods Followed:

PM<sub>10</sub> : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)

PM<sub>2.5</sub> : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)

SO<sub>2</sub> : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)

NO<sub>2</sub> : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)

O<sub>3</sub> : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)

NH<sub>3</sub> : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)

CO : IS 5182 (Pt 10): 1999 (RA 2013)

Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)

C<sub>6</sub>H<sub>6</sub> : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)

B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM<sub>2.5</sub>-Particulate matter size less than 2.5 Micron, PM<sub>10</sub>-Particulate matter size less than 10 Micron; SO<sub>2</sub> Sulphur dioxide; NO<sub>2</sub> - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m<sup>3</sup>); O<sub>3</sub>-Ozone(DL 10 μg/m<sup>3</sup>); NH<sub>3</sub>-Ammonia (DL 5 μg/m<sup>3</sup>); Pb-Lead (DL 0.05 μg/m<sup>3</sup>); As-Arsenic (DL 0.1 ng/m<sup>3</sup>); Ni-Nickel (DL 0.5 ng/m<sup>3</sup>); Benzene-(DL 1 μg/m<sup>3</sup>); B(α)P- Benzo -α-pyrene(DL0.1 ng/m<sup>3</sup>); ng/m<sup>3</sup>: nanogram per cubic meter; μg/m<sup>3</sup> - microgram per cubic meter.

### CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

\*\*\*\*\*End of Report \*\*\*\*\*

  
(Dr K GANESAN)  
Laboratory and Quality Manager Authorized Signatory

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### TEST REPORT

Page No. 1 of 1

Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Project Site/ Address	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Monitoring Description	AMBIENT NOISE LEVEL
Data Collected by	M/s. Hubert Enviro Care Systems Pvt Ltd.,
Date of Monitoring	21-22.04.2021
Report Date	26.04.2021
Report No	HECS/NM/001-005/260421

### RESULTS

Time (Hrs)/ Location	Berth No. 14	Project Site-North Side	Project Site-South Side	Project Site-East Side	Project Site-West Side
06.00	60.9	59.8	57.6	60.9	57.6
07.00	61.5	60.2	58.4	61.2	58.8
08.00	62.5	61.2	59.3	63.8	59.1
09.00	63.3	62.3	60.4	64.5	60.3
10.00	64.8	63.6	61.5	65.3	61.5
11.00	65.7	64.5	62.6	66.6	62.5
12.00	66.9	65.8	63.8	67.2	63.6
13.00	67.8	66.9	64.9	68.9	65.8
14.00	68.2	67.8	65.5	69.3	66.9
15.00	69.2	68.9	67.8	70.9	67.2
16.00	70.5	69.5	69.2	71.5	68.8
17.00	71.6	70.2	70.2	72.9	70.9
18.00	72.9	71.8	70.9	73.9	72.1
19.00	71.4	70.3	69.8	72.4	71.8
20.00	70.8	68.4	69.1	70.6	70.3
21.00	68.5	67.2	68.3	69.5	68.9
22.00	67.3	66.9	67.2	68.2	66.1
23.00	66.9	65.4	66.2	67.8	65.5
00.00	65.5	64.3	64.1	65.5	64.7
01.00	64.6	63.8	62.9	63.1	63.8
02.00	63.8	62.5	62.1	62.3	62.9
03.00	62.1	61.9	60.8	60.6	60.2
04.00	61.2	59.4	58.3	60.2	58.2
05.00	59.8	58.2	57.2	59.4	57.1
MIN	59.8	58.2	57.2	59.4	57.1
MAX	72.9	71.8	70.9	73.9	72.1
Day dB (A)	67.3	66.2	65.1	68.1	65.4
Night dB (A)	63.4	62.2	61.7	62.7	61.8

Limits: Industrial Area: Day Time-75 dB (A), Night Time-70 dB (A). Commercial Area: Day Time-65 dB (A), Night Time-55 dB (A). Residential Area: Day Time-55 dB (A), Night Time-45 dB (A). Silence Zone: Day Time-50 dB (A), Night Time-40 dB (A).

Note: Monitoring Date represents 24 hours from 6:00 am to 6:00 am next day. Legend: Leq- Equivalent Noise Level (hourly); Ld-Day Time Equivalent Noise Level (06:00-22:00 hrs); Ln-Night Time Equivalent Noise Level (22:00-06:00 hrs); and Ldn-24 hourly Equivalent Noise Level.

Reference: The Noise Pollution (Regulation and Control) Rules, 2000, CPCB, New Delhi.



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### TEST REPORT

Page No 1 of 1

Name of the Client	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Client	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Marine Water Monitoring
Sampling Mark	Jetty - Berth No. 14
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Sampling / Received Date	21.04.2021
Analysis Commenced On	21.04.2021
Analysis Completed On	07.05.2021
Report Date	07.05.2021
Report No	HECS/M/002/210421

S. No	Parameters	Test Method Followed	Units	Surface (1m Below surface)	Depth (20m from surface)	Tolerance Limit for harbour water Class SW – IV
1.	pH at 25°C	IS 3025 (Pt 11): 1983 (RA 2017)	-	7.74	7.68	6.5 - 9.0
2.	Colour	IS 3025 (Pt 4) :1983 (RA 2017)	Hazen	Colourless	Colourless	No visible colour
3.	Odour	IS 3025 (Pt 5):1983 (RA 2018)	-	Odourless	Odourless	No offensive odour
4.	Temperature	IS 3025 (Pt 09): 1983 (RA 2006)	°C	30	29	Not Provided
5.	EC at 25°C	IS:3025 (Pt-14): 2013	µS/cm	40000	40000	Not Provided
6.	TDS	IS 3025 (Pt 16): 1984 (RA 2017)	mg/L	25500	26000	Not Provided
7.	Turbidity	IS:3025 (Pt-10): 1984 (RA 2017)	NTU	4.3	3.8	Not Provided
8.	DO	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	4.2	3.4	3.0 mg/L or 40% saturation value whichever is higher
9.	BOD, 3 days at 27°C	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	BDL (DL 2)	BDL (DL 2)	5
10.	COD	IS 3025 (Part - 58):2006	mg/L	BDL (DL 20)	BDL (DL 20)	Not Provided
11.	Floating materials, Oil, grease and scum (including Petroleum products)	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	5.5	3.2	10
12.	Phosphates as P	IS 3025 (Part 31):1988	mg/L	0.42	0.32	Not Provided
13.	Nitrates as N	ASTM: (Part 31)1978	mg/L	0.52	0.63	Not Provided
14.	Sulphates as SO <sub>4</sub>	IS 3025(Part - 24):1986	mg/L	2465	2386	Not Provided
15.	Chloride as Cl	IS 3025 (Part - 32):1988	mg/L	16200	16200	Not Provided
16.	Lead as Pb	IS 3025: (Part - 47)1994(Reaff 2009)	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Provided
17.	Mercury as Hg	IS 3025: (Part48):1994 RA 1999	mg/L	BDL (DL 0.001)	BDL(DL 0.001)	Not Provided
18.	Hexavalent Chromium as Cr <sup>+6</sup>	IS 3025 (Part - 52):2003	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Provided
19.	Escherichia coli (Faecal coli bacteria)	IS1622:1981 (RA 2009)	MPN/100mL	231	289	500/100 mL (MPN)
20.	Intestinal Enterococci (Streptococci)	IS1622:1981 (RA 2009)	MPN/100mL	98	112	500/100 mL (MPN)

Note:- BDL - Below Detection Limit; DL- Detection Limit; µS/cm – micro Siemens per centimeter; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Litre;

MPN - Most Probable Number

(Dr K GANESAN)  
Laboratory and Quality Manager - Authorized Signatory

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### TEST REPORT

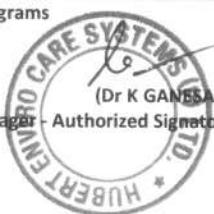
Page 01 of 01

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Sediment Quality Monitoring
Sampling Location	Berth No. 14, Container Yard
Sample Collected by	M/s Hubert Enviro Care Systems (P) Ltd.,
Sampling / Receipt date	21.04.2021
Analysis Commenced on	24.04.2021
Analysis Completed on	07.05.2021
Report Date	07.05.2021
Report No	HECS/S/002/240421

S.No.	Parameters	Units	Results	Test Method
1	Total Phosphorous	mg/kg	0.21	IS 10158 : 1982
2	Oil & Grease	mg/kg	3.2	USEPA Method
3	Nitrates	mg/kg	0.58	IS 14684 : 1999
4	Arsenic as As	mg/kg	0.92	USEPA Method
5	Lead as Pb	mg/kg	0.375	USEPA Method
6	Cadmium as Cd	mg/kg	0.32	USEPA Method
7	Mercury as Hg	mg/kg	BDL (DL 0.1)	USEPA Method
8	PAH	mg/kg	0.27	USEPA Method
9	Pesticides :			
i.	Phorate	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
ii.	<i>o,p</i> -DDT	mg/kg	0.02	USEPA Method 525.2: 1995
iii.	<i>p,p'</i> -DDT	mg/kg	0.056	USEPA Method 525.2: 1995
iv.	<i>o,p</i> -DDD	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
v.	<i>p,p'</i> -DDD	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
vi.	<i>o,p</i> -DDE	mg/kg	0.03	USEPA Method 525.2: 1995
vii.	<i>p,p'</i> -DDE	mg/kg	0.04	USEPA Method 525.2: 1995
viii.	$\alpha$ -Endosulphan	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
ix.	$\beta$ -Endosulphan	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
x.	Endosulphan Sulphate	mg/kg	0.074	USEPA Method 525.2: 1995
xi.	$\alpha$ - HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xii.	$\beta$ - HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xiii.	$\gamma$ -HCH	mg/kg	0.18	USEPA Method 525.2: 1995
xiv.	$\delta$ -HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xv.	Butachlor	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xvi.	Chlorpyrifos	mg/kg	0.02	USEPA Method 525.2: 1995
xvii.	Alachlor	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xviii.	Atrazine	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xix.	Aldrin	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xx.	Dieldrin	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xxi.	Ethion	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995

Note:- BDL - Below the Limit of Quantification; DL- Limit of Quantification; mg/kg- Milligrams per kilograms

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### TEST REPORT

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	<b>Biological Parameters - Phytoplankton's, Zooplanktons &amp; Benthic Communities of Berth No. 14</b>
Sampling date & Receipt	21.04.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.05.2021
Report No	HECS/BC/001/210421

### RESULTS

Distribution of Phytoplankton (Nos./m<sup>3</sup>) in the sampled Berth No. 14

Phytoplankton	At Berth No. 14
<b>DIATOMS</b>	
<i>Coscinodiscus granii</i>	3564
<i>Coscinodiscus centralis</i>	2012
<i>Coscinodisdis marginatus</i>	1284
<i>Thalassiosira nitzschiooides</i>	2354
<i>Thalassiosira sp.</i>	987
<i>Thalassionema frauenfeldii</i>	95
<i>Thalassionema nitzschiooides</i>	224
<i>Thalassiothoursix sp.</i>	758
<i>Biddulphia mobilensis</i>	902
<i>Bacillaria spp.</i>	581
<i>Hemiaulus spp.</i>	6
<i>Chaetoceros affinis</i>	556
<i>Chaetoceros breve</i>	448
<i>Chaetoceros curvisetus</i>	281
<i>Ditylum spp.</i>	395
<i>Planktoniella sol</i>	302
<i>Leptocylindrus spp.</i>	89
<i>Melosira spp.</i>	4
<i>Rhizosolenia styliformis</i>	154
<i>Rhizosolenia alata</i>	25
<i>Rhizosolenia robusta</i>	20
<i>Skeletonema spp.</i>	7
<i>Nitzchia spp.</i>	356
<i>Fragillaria oceanica</i>	978
<i>Navicula spp.</i>	3021
<i>Pleurosigma spp.</i>	1125
<i>Stephanaphysis spp.</i>	128
<i>Schoursoederella spp.</i>	4
<i>Odontella mobilensis</i>	145
<i>Odontella spp.</i>	238

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### TEST REPORT

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	21.04.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.05.2021
Report No	HECS/BC/001/210421

### RESULTS

DINOFLAGELLATES	
<i>Ceratium tripos</i>	921
<i>Ceratium furca</i>	508
<i>Ceratium fusus</i>	156
<i>Ceratium lunula</i>	197
<i>Peridinium depressum</i>	268
<i>Dinophysis spp.</i>	4
<i>Noctiluca spp.</i>	158
<i>Protoperdinium granii</i>	1465
<i>Protoperdinium sp.</i>	568
NANOPLANKTERS	
<i>Chlorella spp.</i>	1
Total biomass (cc/m <sup>3</sup> )	0.457

### Phytoplankton community structure variability in the Berth No. 14

Phytoplankton	S	N	d	J'	H' (log 2)
	40	25289	3.56	0.87	4.18

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

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### TEST REPORT

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	21.04.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.05.2021
Report No	HECS/BC/001/210421

### RESULTS

#### Distribution of Zooplankton (Nos/m<sup>3</sup>) in the Berth No. 14

	Berth No. 14
Dinoflagellates	
Noctiluca spp	125
Ciliates	
Tintinopsis	2365
Protozoa	
Radiolarians	1698
Bryozoa	
Bryozoan larvae	1715
Cnidaria	
Medusae	420
Annelid	
Polychaete larvae	305
Urochordata (Tunicates)	
Oikopleura	1254
Brachiopoda	
Brachiopod larvae	170
Cladocera	2231
Crustacea	
Alima Larvae	198
Crustacean eggs	3001
Decapod	25624
Cypris larvae	6
Crab larvae	8
Lucifer	2564
Protozoa	321
Copepod	17521
Copepod Nauplius	19128
Nauplius	4
Barnacle Nauplius	4
PISCES	
Fish Egg	79
HEXAPODA	
Insect	3
Total biomass (cc/m <sup>3</sup> )	1.45

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### TEST REPORT

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,				
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.				
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14				
Sampling date & Receipt	21.04.2021				
Sample Collected by	Hubert Enviro Care Systems (P) Ltd				
Report Date	10.05.2021				
Report No	HECS/BC/001/210421				

### RESULTS

#### Zooplankton community structure variability in the berth No. 14

Zooplankton	S	N	d	J'	H' (log 2)
Berth No. 14	22	78744	2.09	0.70	2.94

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

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### TEST REPORT

Page 5 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	21.04.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.05.2021
Report No	HECS/BC/001/210421

### RESULTS

#### Distribution of benthos (Nos/m<sup>2</sup>) in the identified Berth No. 14

	Berth No. 14
<b>CRUSTACEA</b>	
Amphipod	2
Isopods	4
Cumacea	100
Crustacean eggs	1456
Crustacean	4
Mysids	5
Egg mass	218
Brachyuran crabs	1387
<b>MOLLUSCA</b>	
Bivalves	285
Gastropods	274
<b>SCAPHOPODA</b>	
Dentalium	180
<b>FORAMINIFERA</b>	
Foraminifera	230
<b>CNIDARIA</b>	
Medusa	1
<b>ANNELIDA</b>	
Nereidae	218
Polychaetes	257
Spionidae	1587
<b>HYDROZOA</b>	
Hydrozoans	295
<b>Total biomass (g/m<sup>2</sup>)</b>	143.5

(Dr K Ganesan - Laboratory and Quality Manager)



Authorized Signatory

# ert Enviro Care Systems (P) Ltd.

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TC-5786

## Laboratory Services Division

(Chemical & Biological Testing)  
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 ISO 9001, 14001 & OHSAS 18001 Certified.

### TEST REPORT

Page 6 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,				
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.				
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14				
Sampling date & Receipt	21.04.2021				
Sample Collected by	Hubert Enviro Care Systems (P) Ltd				
Report Date	10.05.2021				
Report No	HECS/BC/001/210421				

### RESULTS

#### Benthos community structure variability in the Berth No. 14

Benthos	S	N	d	J'	H' (log 2)
Berth No. 14	17	6503	2.38	0.88	3.15

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

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## TEST REPORT

Page No. 1 of 1

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sample Description	<b>DISCHARGE OF TREATED SURFACE RUNOFF</b>
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Date of Sampling	21.05.2021
Qty. of sample received	2 L in HDPE Can and 1 L in Amber bottle
Date of Sample Receipt	21.05.2021
Analysis Commenced On	21.05.2021
Completed On	28.05.2021
Report No	HECSM/WW/001/210521
Report Date	29.05.2021

## RESULTS – MAY 2021

S.No.	Parameters monitored	Test method followed	Units	Results	KSPCB Std
1.	pH at 25°C	IS 3025 (Part-11) 1983	-	7.02	6.5-9.0
2.	Total Suspended Solids (TSS)	2540 D APHA 23 <sup>rd</sup> Edn., 2017	mg/L	6.4	≤ 20
3.	Oil and Grease	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	BDL (DL 2)	≤ 10
4.	BOD, 3 days at 27°C as O <sub>2</sub>	IS:3025 (Pt 44)1993(RA 2009)	mg/L	2.9	≤ 10
5.	Chemical Oxygen Demand as O <sub>2</sub>	IS 3025 (Pt 58): 2006 (RA 2017)	mg/L	14.5	≤ 50
6.	Phenolic content as C <sub>6</sub> H <sub>5</sub> OH	IS 3025 (Pt 43): 1992 (RA 2013)	mg/L	BDL (DL 0.001)	≤ 1.0

Note: mg/L - Milligrams per Liter

INFERENCE	As per KSPCB standards, The analysed parameters are within the prescribed limit.
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\*\*\*End of Report\*\*\*

Authorized Signatory  
(Dr K Ganesan - Laboratory and Quality Manager)



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## TEST REPORT

Page No. 1 of 1

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sample Description	<b>DISCHARGE OF TREATED SURFACE RUNOFF</b>
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Date of Sampling	21.06.2021
Qty. of sample received	2 L in HDPE Can and 1 L in Amber bottle
Date of Sample Receipt	21.06.2021
Analysis Commenced On	21.06.2021
Completed On	28.06.2021
Report No	HECSM/WW/002/210621
Report Date	29.06.2021

## RESULTS – JUNE 2021

S.No.	Parameters monitored	Test method followed	Units	Results	KSPCB Std
1.	pH at 25°C	IS 3025 (Part-11) 1983	-	6.87	6.5-9.0
2.	Total Suspended Solids (TSS)	2540 D APHA 23 <sup>rd</sup> Edn., 2017	mg/L	7.2	≤ 20
3.	Oil and Grease	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	BDL (DL 2)	≤ 10
4.	BOD, 3 days at 27°C as O <sub>2</sub>	IS:3025 (Pt 44)1993(RA 2009)	mg/L	5.7	≤ 10
5.	Chemical Oxygen Demand as O <sub>2</sub>	IS 3025 (Pt 58): 2006 (RA 2017)	mg/L	21.8	≤ 50
6.	Phenolic content as C <sub>6</sub> H <sub>6</sub> OH	IS 3025 (Pt 43): 1992 (RA 2013)	mg/L	BDL (DL 0.001)	≤ 1.0

Note: mg/L - Milligrams per Liter

INFERENCE	As per KSPCB standards, The analysed parameters are within the prescribed limit.
-----------	---

\*\*\*End of Report\*\*\*

Authorized Signatory  
(Dr K Ganesan - Laboratory and Quality Manager)



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TC-5786

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## TEST REPORT

Page No. 1 of 1

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sample Description	<b>DISCHARGE OF TREATED SURFACE RUNOFF</b>
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Date of Sampling	21.07.2021
Qty. of sample received	2 L in HDPE Can and 1 L in Amber bottle
Date of Sample Receipt	21.07.2021
Analysis Commenced On	21.07.2021
Completed On	28.07.2021
Report No	HECSM/WW/005/210721
Report Date	29.07.2021

## RESULTS – JULY 2021

S.No.	Parameters monitored	Test method followed	Units	Results	KSPCB Std
1.	pH at 25°C	IS 3025 (Part-11) 1983	-	6.85	6.5-9.0
2.	Total Suspended Solids (TSS)	2540 D APHA 23 <sup>rd</sup> Edn., 2017	mg/L	5.9	≤ 20
3.	Oil and Grease	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	BDL (DL 2)	≤ 10
4.	BOD, 3 days at 27°C as O <sub>2</sub>	IS:3025 (Pt 44)1993(RA 2009)	mg/L	3.1	≤ 10
5.	Chemical Oxygen Demand as O <sub>2</sub>	IS 3025 (Pt 58): 2006 (RA 2017)	mg/L	14.2	≤ 50
6.	Phenolic content as C <sub>6</sub> H <sub>5</sub> OH	IS 3025 (Pt 43): 1992 (RA 2013)	mg/L	BDL (DL 0.001)	≤ 1.0

Note: mg/L - Milligrams per Liter

INFERENCE	As per KSPCB standards, The analysed parameters are within the prescribed limit.
-----------	---

\*\*\*End of Report\*\*\*

Authorized Signatory  
(Dr K Ganesan - Laboratory and Quality Manager)



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## TEST REPORT

Page No. 1 of 1

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sample Description	<b>DISCHARGE OF TREATED SURFACE RUNOFF</b>
Sample Mark	<b>Jetty - Berth No. 14</b>
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Date of Sampling	21.08.2021
Qty. of sample received	2 L in HDPE Can and 1 L in Amber bottle
Date of Sample Receipt	21.08.2021
Analysis Commenced On	21.08.2021
Completed On	28.08.2021
Report No	HECSM/WW/003/210821
Report Date	29.08.2021

## RESULTS – AUGUST 2021

S.No.	Parameters monitored	Test method followed	Units	Results	KSPCB Std
1.	pH at 25°C	IS 3025 (Part-11) 1983	-	7.23	6.5-9.0
2.	Total Suspended Solids (TSS)	2540 D APHA 23 <sup>rd</sup> Edn., 2017	mg/L	6.8	≤ 20
3.	Oil and Grease	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	BDL (DL 2)	≤ 10
4.	BOD, 3 days at 27°C as O <sub>2</sub>	IS:3025 (Pt 44)1993(RA 2009)	mg/L	6.9	≤ 10
5.	Chemical Oxygen Demand as O <sub>2</sub>	IS 3025 (Pt 58): 2006 (RA 2017)	mg/L	21.3	≤ 50
6.	Phenolic content as C <sub>6</sub> H <sub>6</sub> OH	IS 3025 (Pt 43): 1992 (RA 2013)	mg/L	BDL (DL 0.001)	≤ 1.0

Note: mg/L - Milligrams per Liter

INFERENCE	As per KSPCB standards, The analysed parameters are within the prescribed limit.
-----------	---

\*\*\*End of Report\*\*\*

Authorized Signatory  
(Dr K Ganesan - Laboratory and Quality Manager)

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## TEST REPORT

Page 2 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sampling Location	BERTH NO. 14 UP STREAM
Sample Description	AAQ 2: Ambient Air Quality Monitoring (24 hrs)
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Report Date	07.06.2021
Report No	HECS/A/002/070621
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini

## RESULTS

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni
	µg/m <sup>3</sup>				mg/m <sup>3</sup>	µg/m <sup>3</sup>				ng/m <sup>3</sup>		
10.05.2021	11.6	16.4	45.6	23.6	0.12	BDL	10.6	BDL	BDL	BDL	BDL	BDL
14.05.2021	10.1	15.2	40.3	20.4	0.11	BDL	10.1	BDL	BDL	BDL	BDL	BDL
17.05.2021	10.9	15.9	42.3	21.3	0.13	BDL	10.7	BDL	BDL	BDL	BDL	BDL
21.05.2021	13.4	18.6	46.3	25.6	0.19	BDL	12.6	BDL	BDL	BDL	BDL	BDL
24.05.2021	14.3	19.7	45.9	26.1	0.17	BDL	13.1	BDL	BDL	BDL	BDL	BDL
28.05.2021	13.9	19.1	46.9	24.9	0.16	BDL	12.8	BDL	BDL	BDL	BDL	BDL
Min.	10.1	15.2	40.3	20.4	0.11	BDL	10.1	BDL	BDL	BDL	BDL	BDL
Max.	14.3	19.7	46.9	26.1	0.19	BDL	13.1	BDL	BDL	BDL	BDL	BDL
Avg.	12.4	17.5	44.5	23.7	0.15	BDL	11.7	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: \*: 24 hours average; \*\*: 8 hours average; \*\*\*: Annual average

### Test Methods Followed:

- PM<sub>10</sub> : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM<sub>2.5</sub> : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO<sub>2</sub> : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
- NO<sub>2</sub> : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O<sub>3</sub> : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH<sub>3</sub> : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C<sub>6</sub>H<sub>6</sub> : GC FID / GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM<sub>2.5</sub>-Particulate matter size less than 2.5 Micron, PM<sub>10</sub>-Particulate matter size less than 10 Micron; SO<sub>2</sub> Sulphur dioxide; NO<sub>2</sub> - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m<sup>3</sup>); O<sub>3</sub>-Ozone(DL 10 µg/m<sup>3</sup>); NH<sub>3</sub>-Ammonia (DL 5 µg/m<sup>3</sup>); Pb-Lead (DL 0.05 µg/m<sup>3</sup>); As-Arsenic (DL 0.1 ng/m<sup>3</sup>); Ni-Nickel (DL 0.5 ng/m<sup>3</sup>); Benzene-(DL 1 µg/m<sup>3</sup>); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m<sup>3</sup>); ng/m<sup>3</sup>: nanogram per cubic meter; µg/m<sup>3</sup> - microgram per cubic meter.

## CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

\*\*\*\*\*End of Report \*\*\*\*\*

Laboratory and Quality Manager



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Certificate No. TC-5786

### TEST REPORT

Page 3 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sampling Location	BERTH NO. 14 DOWN STREAM
Sample Description	AAQ 3: Ambient Air Quality Monitoring (24 hrs)
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Report Date	07.06.2021
Report No	HECS/A/003/070621
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini

### RESULTS

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni
			µg/m <sup>3</sup>		mg/m <sup>3</sup>			µg/m <sup>3</sup>				ng/m <sup>3</sup>
10.05.2021	13.7	18.6	47.8	26.3	0.14	BDL	10.9	BDL	BDL	BDL	BDL	BDL
14.05.2021	11.2	16.4	42.1	21.5	0.12	BDL	10.2	BDL	BDL	BDL	BDL	BDL
17.05.2021	11.6	17.3	43.8	23.1	0.16	BDL	11.3	BDL	BDL	BDL	BDL	BDL
21.05.2021	14.9	20.2	45.9	26.7	0.24	BDL	13.8	BDL	BDL	BDL	BDL	BDL
24.05.2021	15.6	19.7	46.7	27.2	0.26	BDL	13.1	BDL	BDL	BDL	BDL	BDL
28.05.2021	15.2	19.1	48.2	27.3	0.23	BDL	13.5	BDL	BDL	BDL	BDL	BDL
Min.	11.2	16.4	42.1	21.5	0.12	BDL	10.2	BDL	BDL	BDL	BDL	BDL
Max.	15.6	20.2	48.2	27.3	0.26	BDL	13.8	BDL	BDL	BDL	BDL	BDL
Avg.	13.7	18.6	45.8	25.4	0.19	BDL	12.1	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: \* 24 hours average; \*\* 8 hours average; \*\*\* Annual average

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- PM<sub>10</sub> : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
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- NO<sub>2</sub> : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O<sub>3</sub> : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH<sub>3</sub> : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C<sub>6</sub>H<sub>6</sub> : GC FID / GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM<sub>2.5</sub>-Particulate matter size less than 2.5 Micron, PM<sub>10</sub>-Particulate matter size less than 10 Micron; SO<sub>2</sub> Sulphur dioxide; NO<sub>2</sub> - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m<sup>3</sup>); O<sub>3</sub>-Ozone(DL 10 µg/m<sup>3</sup>); NH<sub>3</sub>-Ammonia (DL 5 µg/m<sup>3</sup>); Pb-Lead (DL 0.05 µg/m<sup>3</sup>); As-Arsenic (DL 0.1 ng/m<sup>3</sup>); Ni-Nickel (DL 0.5 ng/m<sup>3</sup>); Benzene-(DL 1 µg/m<sup>3</sup>); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m<sup>3</sup>); ng/m<sup>3</sup>: nanogram per cubic meter; µg/m<sup>3</sup> - microgram per cubic meter.

### CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

\*\*\*\*\*End of Report \*\*\*\*\*

Laboratory and Quality Manager



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### TEST REPORT

Page No. 1 of 1

Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Project Site/ Address	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Monitoring Description	<b>AMBIENT NOISE LEVEL</b>
Data Collected by	M/s. Hubert Enviro Care Systems Pvt Ltd.,
Date of Monitoring	21-22.05.2021
Report Date	24.05.2021
Report No	HECS/NM/001-005/220521

### RESULTS

Time (Hrs)/ Location	Berth No. 14	Project Site- North Side	Project Site- South Side	Project Site- East Side	Project Site- West Side
06.00	60.3	57.8	59.1	61.3	55.8
07.00	61.5	58.9	60.6	62.4	56.4
08.00	62.3	59.6	61.3	63.4	57.9
09.00	63.4	60.3	62.3	64.5	58.6
10.00	64.5	61.5	63.5	65.1	60.8
11.00	66.5	62.6	64.5	66.7	61.3
12.00	67.1	63.7	65.8	68.9	62.4
13.00	68.3	64.9	66.9	69.4	63.5
14.00	69.5	65.6	70.3	70.3	64.5
15.00	70.6	66.8	71.3	71.2	66.9
16.00	71.3	67.8	72.6	72.1	68.4
17.00	72.3	69.8	73.6	72.3	69.1
18.00	73.4	70.2	74.2	73.9	70.2
19.00	72.1	69.5	72.1	71.3	69.7
20.00	71.6	68.1	71.3	70.9	68.1
21.00	70.6	67.2	70.6	69.5	67.8
22.00	69.5	66.3	69.8	68.4	66.9
23.00	68.4	65.5	68.4	67.3	65.2
00.00	67.2	64.2	67.5	66.5	64.3
01.00	66.9	63.8	66.9	64.5	63.2
02.00	65.1	62.3	65.3	63.2	62.6
03.00	64.3	60.2	63.2	62.3	61.7
04.00	62.1	58.4	62.1	60.2	58.4
05.00	61.8	57.1	60.8	59.8	56.3
MIN	60.3	57.1	59.1	59.8	55.8
MAX	73.4	70.2	74.2	73.9	70.2
Day dB (A)	67.9	64.7	67.6	68.3	64.0
Night dB (A)	65.1	61.6	64.9	63.4	61.7

Limits: Industrial Area: Day Time-75 dB (A), Night Time-70 dB (A). Commercial Area: Day Time-65 dB (A), Night Time-55 dB (A). Residential Area: Day Time-55 dB (A), Night Time-45 dB (A). Silence Zone: Day Time-50 dB (A), Night Time-40 dB (A).

Note: Monitoring Date represents 24 hours from 6:00 am to 6:00 am next day. Legend: Leq- Equivalent Noise Level (hourly); Ld-Day Time Equivalent Noise Level (06:00-22:00 hrs); Ln-Night Time Equivalent Noise Level (22:00-06:00 hrs); and Ldn-24 hourly Equivalent Noise Level.

Reference: The Noise Pollution (Regulation and Control) Rules, 2000, CPCB, New Delhi.

  
 (Dr K Ganesan – Laboratory Head and Quality Manager)

# Hubert Enviro Care Systems (P) Ltd.

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## Laboratory Services Division

(Chemical & Biological Testing)

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Certificate No. TC-5786

## TEST REPORT

Page No 1 of 1

Name of the Client	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Client	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Marine Water Monitoring
Sampling Mark	Jetty - Berth No. 14
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Sampling / Received Date	17.05.2021
Analysis Commenced On	17.05.2021
Analysis Completed On	31.05.2021
Report Date	01.06.2021
Report No	HECS/M/001/170521

S. No	Parameters	Test Method Followed	Units	Surface (1m Below surface)	Depth (20m from surface)	Tolerance Limit for harbour water Class SW – IV
1.	pH at 25°C	IS 3025 (Pt 11): 1983 (RA 2017)	-	7.92	7.84	6.5 - 9.0
2.	Colour	IS 3025 (Pt 4) :1983 (RA 2017)	Hazen	Colourless	Colourless	No visible colour
3.	Odour	IS 3025 (Pt 5):1983 (RA 2018)	-	Odourless	Odourless	No offensive odour
4.	Temperature	IS 3025 (Pt 09): 1983 (RA 2006)	°C	28	27	Not Provided
5.	EC at 25°C	IS:3025 (Pt-14): 2013	µS/cm	39000	39000	Not Provided
6.	TDS	IS 3025 (Pt 15): 1984 (RA 2017)	mg/L	24500	24480	Not Provided
7.	Turbidity	IS:3025 (Pt-10): 1984 (RA 2017)	NTU	3	2.5	Not Provided
8.	DO	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	4.3	4.1	3.0 mg/L or 40% saturation value whichever is higher
9.	BOD, 3 days at 27°C	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	BDL (DL 2)	BDL (DL 2)	5
10.	COD	IS 3025 (Part - 58):2006	mg/L	BDL (DL 20)	BDL (DL 20)	Not Provided
11.	Floating materials, Oil, grease and scum (including Petroleum products)	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	4.2	2.3	10
12.	Phosphates as P	IS 3025 (Part 31):1988	mg/L	0.35	0.30	Not Provided
13.	Nitrates as N	ASTM: (Part - 31)1978	mg/L	0.47	0.50	Not Provided
14.	Sulphates as SO <sub>4</sub>	IS 3025(Part - 24):1986	mg/L	2460	2395	Not Provided
15.	Chloride as Cl	IS 3025 (Part - 32):1988	mg/L	16500	16500	Not Provided
16.	Lead as Pb	IS 3025: (Part - 47)1994(Reaff 2009)	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Provided
17.	Mercury as Hg	IS 3025: (Part48):1994 RA 1999	mg/L	BDL (DL 0.001)	BDL(DL 0.001)	Not Provided
18.	Hexavalent Chromium as Cr <sup>+6</sup>	IS 3025 (Part - 52):2003	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Provided

Note:- BDL - Below Detection Limit; DL- Detection Limit; µS/cm – micro Siemens per centimeter; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Litre

Laboratory and Quality Manager / Authorized Signatory



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### TEST REPORT

Page 01 of 01

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Sediment Quality Monitoring
Sampling Location	Berth No. 14, Container Yard
Sample Collected by	M/s Hubert Enviro Care Systems (P) Ltd.,
Sampling / Receipt date	17.05.2021
Analysis Commenced on	20.05.2021
Analysis Completed on	31.05.2021
Report Date	01.06.2021
Report No	HECS/S/002/200521

S.No.	Parameters	Units	Results	Test Method
1	Total Phosphorous	mg/kg	0.21	IS 10158 : 1982
2	Oil & Grease	mg/kg	3.2	USEPA Method
3	Nitrates	mg/kg	0.47	IS 14684 : 1999
4	Arsenic as As	mg/kg	0.93	USEPA Method
5	Lead as Pb	mg/kg	0.408	USEPA Method
6	Cadmium as Cd	mg/kg	0.45	USEPA Method
7	Mercury as Hg	mg/kg	BDL (DL 0.1)	USEPA Method
8	PAH	mg/kg	0.32	USEPA Method
9	Pesticides :			
i.	Phorate	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
ii.	o,p-DDT	mg/kg	0.05	USEPA Method 525.2: 1995
iii.	p,p'-DDT	mg/kg	0.082	USEPA Method 525.2: 1995
iv.	o,p-DDD	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
v.	p,p'-DDD	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
vi.	o,p-DDE	mg/kg	0.05	USEPA Method 525.2: 1995
vii.	p,p'-DDE	mg/kg	0.04	USEPA Method 525.2: 1995
viii.	Endosulphan alpha	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
ix.	Endosulphan Beta	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
x.	Endosulphan Sulphate	mg/kg	0.092	USEPA Method 525.2: 1995
xi.	Alpha HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xii.	Beta HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xiii.	Gamma HCH	mg/kg	0.21	USEPA Method 525.2: 1995
xiv.	Delta HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xv.	Butachlor	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xvi.	Chlorpyrifos	mg/kg	0.05	USEPA Method 525.2: 1995
xvii.	Alachlor	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xviii.	Atrazine	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xix.	Aldrin	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xx.	Dieldrin	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xxi.	Ethion	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995

Note: - BDL - Below the Limit of Quantification; DL- Limit of Quantification; mg/kg- Milligrams per kilograms

For K GANESAN  
Laboratory and Quality Manager / Authorized Signatory



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### TEST REPORT

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sample Description	Soil Quality Monitoring
Sample Collected by	M/s Hubert Enviro Care Systems (P) Ltd
Sampling Location	Berth No. 14, Container Yard – Project Site
Sampling / Receipt date	17.05.2021
Analysis Commenced on	20.05.2021
Analysis Completed on	31.05.2021
Report Date	01.06.2021
Report No	HECS/S/001/200521

### RESULTS

S.No.	Parameters monitored	Units	Results	Test Method
<b>I - Physical Properties</b>				
1.	Sand %	%	58.33	Dinnes, 2004
2.	Silt %	%	10.32	Dinnes, 2004
3.	Clay %	%	31.35	Dinnes, 2004
<b>II - Chemical Properties</b>				
4.	pH at 25°C (10% solution)	-	7.64	IS : 2720(P-26,1987)
5.	Colour	-	Brown	Anon 1980
6.	Bulk Density	gm/cc	1.25	Anon 1980
7.	Moisture Content	%	6.54	IS 2720 : Part 9 : 1992
8.	Organic Carbon	%	0.74	Walkley and Black, 1934
9.	Exchangeable Calcium	Cmol(p+)/kg	320.8	Page et al., 1982
10.	Exchangeable Sodium	Cmol(p+)/kg	180.6	Jackson, 1973
11.	Exchangeable Magnesium	Cmol(p+)/kg	50.87	Jackson, 1973
12.	Cation Exchange capacity	Cmol(p+)/kg	4.65	Jackson, 1973
13.	Available Nitrogen	Kg/ha	480.74	Kjeldhal digestion- Distillation method
14.	Available phosphorous	Kg/ha	35.41	Jackson, 1973
15.	Available Potassium	Kg/ha	150.24	Page et al., 1982
16.	Available Zinc	mg/kg	5.87	Page et al., 1982
17.	Available Manganese	mg/kg	68.86	Mortvedt et al., 1991
18.	Available Copper	mg/kg	43.51	Mortvedt et al., 1991
19.	Available iron	mg/kg	3900.8	Mortvedt et al., 1991
20.	Lead	mg/kg	8.87	EPA 3050 B/EPA 7420
21.	Chromium	mg/kg	23.15	EPA 3050 B/EPA 7090

Note: gm/cc - Gram per cubic centimeter; mg/kg- Milligrams per kilogram; % - Percentage; DL - Detection Limit; BDL-Below detection limit; Cmol (p+)/kg - centimoles (charged) per kilogram; Kg/ha: Kilogram per hectare

\*\*\*End of Report\*\*\*

Laboratory and Quality Manager - Authorized Signatory



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### TEST REPORT

Page 1 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	20.05.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.06.2021
Report No	HECS/BC/001/200521

### RESULTS

Distribution of Phytoplankton (Nos./m<sup>3</sup>) in the sampled Berth No. 14

Phytoplankton	At Berth No. 14
<b>DIATOMS</b>	
<i>Coscinodiscus granii</i>	3582
<i>Coscinodiscus centralis</i>	1845
<i>Coscinodisdis marginatus</i>	1054
<i>Thalassiosira nitzschiooides</i>	2642
<i>Thalassiosira sp.</i>	943
<i>Thalassionema frauenfeldii</i>	96
<i>Thalassionema nitzschiooides</i>	158
<i>Thalassiothoursix sp.</i>	738
<i>Biddulphia mobilensis</i>	867
<i>Bacillaria spp.</i>	583
<i>Hemiaulus spp.</i>	3
<i>Chaetoceros affinis</i>	482
<i>Chaetoceros breve</i>	410
<i>Chaetoceros curvisetus</i>	297
<i>Ditylum spp.</i>	422
<i>Planktoniella sol</i>	284
<i>Leptocylindrus spp.</i>	88
<i>Melosira spp.</i>	2
<i>Rhizosolenia styliformis</i>	123
<i>Rhizosolenia alata</i>	25
<i>Rhizosolenia robusta</i>	13
<i>Skeletonema spp.</i>	4
<i>Nitzchia spp.</i>	346
<i>Fragillaria oceanica</i>	946
<i>Navicula spp.</i>	2854
<i>Pleurosigma spp.</i>	1045
<i>Stephanaphysis spp.</i>	117
<i>Schoursoederella spp.</i>	2
<i>Odontella mobiliensis</i>	138
<i>Odontella spp.</i>	

(Dr K Ganesan - Laboratory and Quality Manager)



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## TEST REPORT

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	20.05.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.06.2021
Report No	HECS/BC/001/200521

## RESULTS

DINOFLAGELLATES	
<i>Ceratium tripos</i>	974
<i>Ceratium furca</i>	482
<i>Ceratium fusus</i>	133
<i>Ceratium lunula</i>	185
<i>Peridinium depressum</i>	251
<i>Dinophysis spp.</i>	2
<i>Noctiluca spp.</i>	143
<i>Protoperidinium granii</i>	1421
<i>Protoperidinium sp.</i>	528
NANOPLANKTERS	
<i>Chlorella spp.</i>	0
Total biomass (cc/m <sup>3</sup> )	0.421

### Phytoplankton community structure variability in the Berth No. 14

Phytoplankton	S	N	d	J'	H' (log 2)
	39	24442	3.14	0.77	3.98

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity Shannon-Wiener	bits/individual
High	>4
Good	3-4
Moderate	3-2
Poor	2-1
Bad	1-0

Authorized Signatory  
(Dr K Ganesan - Laboratory and Quality Manager)



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**TEST REPORT**

Page 3 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	<b>Biological Parameters - Phytoplankton's, Zooplanktons &amp; Benthic Communities of Berth No. 14</b>
Sampling date & Receipt	20.05.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.06.2021
Report No	HECS/BC/001/200521

**RESULTS****Distribution of Zooplankton (Nos/m<sup>3</sup>) in the Berth No. 14**

	Berth No. 14
<b>Dinoflagellates</b>	
Noctiluca spp	95
<b>Ciliates</b>	
Tintinopsis	2150
<b>Protozoa</b>	
Radiolarians	1542
<b>Bryozoa</b>	
Bryozoan larvae	1730
<b>Cnidaria</b>	
Medusae	365
<b>Annelid</b>	
Polychaete larvae	304
<b>Urochordata (Tunicates)</b>	
Oikopleura	1083
<b>Brachiopoda</b>	
Brachiopod larvae	188
Cladocera	2260
<b>Crustacea</b>	
Alima Larvae	192
Crustacean eggs	2853
Decapod	25852
Cypris larvae	4
Crab larvae	5
Lucifer	2510
Protozoa	325
Copepod	17240
Copepod Nauplius	18725
Nauplius	2
Barnacle Nauplius	1
<b>PISCES</b>	
Fish Egg	65
<b>HEXAPODA</b>	
Insect	1
Total biomass (cc/m <sup>3</sup> )	1.23

(Dr K Ganesan - Laboratory and Quality Manager)

Authorized Signatory  
(Dr K Ganesan - Laboratory and Quality Manager)

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**TEST REPORT**

Page 4 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	20.05.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.06.2021
Report No	HECS/BC/001/200521

**RESULTS****Zooplankton community structure variability in the berth No. 14**

Zooplankton	S	N	d	J'	H' (log 2)
Berth No. 14	22	77492	1.35	0.49	2.31

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

Authorized Signature  
(Dr K Ganesan - Laboratory and Quality Manager)



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**TEST REPORT**

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	20.05.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.06.2021
Report No	HECS/BC/001/200521

**RESULTS**

**Distribution of benthos (Nos/m<sup>2</sup>) in the identified Berth No. 14**

	Berth No. 14
<b>CRUSTACEA</b>	
Amphipod	0
Isopods	1
Cumacea	74
Crustacean eggs	1258
Crustacean	2
Mysids	3
Egg mass	210
Brachyuran crabs	1352
<b>MOLLUSCA</b>	
Bivalves	253
Gastropods	284
<b>SCAPHOPODA</b>	
Dentalium	196
<b>FORAMINIFERA</b>	
Foraminifera	214
<b>CNIDARIA</b>	
Medusa	0
<b>ANNELIDA</b>	
Nereidae	195
Polychaetes	245
Spionodae	1460
<b>HYDROZOA</b>	
Hydrozoans	243
<b>Total biomass (g/m<sup>2</sup>)</b>	127.48

Authorized Signatory  
(Dr K Ganesan - Laboratory and Quality Manager)



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## TEST REPORT

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	20.05.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.06.2021
Report No	HECS/BC/001/200521

## RESULTS

### Benthos community structure variability in the Berth No. 14

Benthos	S	N	d	J'	H' (log 2)
Berth No. 14	15	5990	1.01	0.75	2.95

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

Authorized Signatory  
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Jun. 21

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### TEST REPORT

Page 1 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sampling Location	CONTAINER YARD – PROJECT SITE
Sample Description	AAQ 1: Ambient Air Quality Monitoring (24 hrs)
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Report Date	07.07.2021
Report No	HECS/A/001-007/070721
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini

### RESULTS

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni	
	μg/m <sup>3</sup>					mg/m <sup>3</sup>				μg/m <sup>3</sup>			
03.06.2021	13.8	19.2	42.9	22.4	0.10	BDL	11.5	BDL	BDL	BDL	BDL	BDL	BDL
07.06.2021	13.6	19.6	45.8	21.9	0.14	BDL	10.3	BDL	BDL	BDL	BDL	BDL	BDL
11.06.2021	13.1	18.3	44.6	22.1	0.12	BDL	10.8	BDL	BDL	BDL	BDL	BDL	BDL
14.06.2021	14.7	19.1	43.1	21.8	0.13	BDL	11.4	BDL	BDL	BDL	BDL	BDL	BDL
18.06.2021	13.9	20.3	45.9	22.6	0.16	BDL	12.1	BDL	BDL	BDL	BDL	BDL	BDL
21.06.2021	14.1	22.4	46.2	23.1	0.21	BDL	12.8	BDL	BDL	BDL	BDL	BDL	BDL
25.06.2021	15.1	21.8	47.1	23.8	0.26	BDL	11.9	BDL	BDL	BDL	BDL	BDL	BDL
28.06.2021	12.8	18.5	44.7	20.5	0.15	BDL	10.2	BDL	BDL	BDL	BDL	BDL	BDL
Min.	12.8	18.3	42.9	20.5	0.1	BDL	10.2	BDL	BDL	BDL	BDL	BDL	BDL
Max.	15.1	22.4	47.1	23.8	0.26	BDL	12.8	BDL	BDL	BDL	BDL	BDL	BDL
Avg.	13.9	19.9	45.0	22.3	0.2	BDL	11.4	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***	

Note: \*: 24 hours average; \*\*: 8 hours average; \*\*\*: Annual average

#### Test Methods Followed:

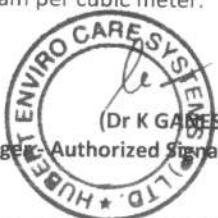
- PM<sub>10</sub> : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM<sub>2.5</sub> : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO<sub>2</sub> : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
- NO<sub>2</sub> : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O<sub>3</sub> : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH<sub>3</sub> : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C<sub>6</sub>H<sub>6</sub> : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM<sub>2.5</sub>-Particulate matter size less than 2.5 Micron, PM<sub>10</sub>-Particulate matter size less than 10 Micron; SO<sub>2</sub> Sulphur dioxide; NO<sub>2</sub> - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m<sup>3</sup>); O<sub>3</sub>-Ozone(DL 10 μg/m<sup>3</sup>); NH<sub>3</sub>-Ammonia (DL 5 μg/m<sup>3</sup>); Pb-Lead (DL 0.05 μg/m<sup>3</sup>); As-Arsenic (DL 0.1 ng/m<sup>3</sup>); Ni-Nickel (DL 0.5 ng/m<sup>3</sup>); Benzene-(DL 1 μg/m<sup>3</sup>); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m<sup>3</sup>); ng/m<sup>3</sup>: nanogram per cubic meter; μg/m<sup>3</sup> - microgram per cubic meter.

#### CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

\*\*\*\*\*End of Report \*\*\*\*\*

Laboratory and Quality Manager Authorized Signatory



- The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization
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- Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report.
- The test results relate only to the test items.

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## Laboratory Services Division

(Chemical & Biological Testing)

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ISO 9001, 14001 & OHSAS 18001 Certified.

Certificate No. TC-5786

## TEST REPORT

Page 2 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	BERTH NO. 14 UP STREAM										
Sample Description	AAQ 2: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.07.2021										
Report No	HECS/A/008-014/070721										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

## RESULTS

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni
	µg/m <sup>3</sup>				mg/m <sup>3</sup>	µg/m <sup>3</sup>				ng/m <sup>3</sup>		
03.06.2021	11.7	16.5	45.3	23.4	0.12	BDL	11.4	BDL	BDL	BDL	BDL	BDL
07.06.2021	10.3	15.1	41.3	20.9	0.10	BDL	10.0	BDL	BDL	BDL	BDL	BDL
11.06.2021	9.9	14.8	41.9	19.4	0.12	BDL	10.4	BDL	BDL	BDL	BDL	BDL
14.06.2021	10.1	15.3	43.1	20.6	0.15	BDL	10.9	BDL	BDL	BDL	BDL	BDL
18.06.2021	11.3	16.4	42.9	21.8	0.16	BDL	11.6	BDL	BDL	BDL	BDL	BDL
21.06.2021	12.7	16.8	43.6	22.1	0.21	BDL	12.3	BDL	BDL	BDL	BDL	BDL
25.06.2021	12.3	17.6	44.8	22.7	0.23	BDL	11.9	BDL	BDL	BDL	BDL	BDL
28.06.2021	10.4	15.9	41.6	20.4	0.15	BDL	10.3	BDL	BDL	BDL	BDL	BDL
Min.	9.9	14.8	41.3	19.4	0.1	BDL	10	BDL	BDL	BDL	BDL	BDL
Max.	12.7	17.6	45.3	23.4	0.23	BDL	12.3	BDL	BDL	BDL	BDL	BDL
Avg.	11.1	16.1	43.1	21.4	0.2	BDL	11.1	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: \*: 24 hours average; \*\*: 8 hours average; \*\*\*: Annual average

### Test Methods Followed:

- PM<sub>10</sub> : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM<sub>2.5</sub> : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO<sub>2</sub> : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
- NO<sub>2</sub> : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O<sub>3</sub> : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH<sub>3</sub> : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C<sub>6</sub>H<sub>6</sub> : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
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BDL =Below detection limit; DL - Detection Limit; PM<sub>2.5</sub>-Particulate matter size less than 2.5 Micron, PM<sub>10</sub>-Particulate matter size less than 10 Micron; SO<sub>2</sub> Sulphur dioxide; NO<sub>2</sub> - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m<sup>3</sup>); O<sub>3</sub>-Ozone(DL 10 µg/m<sup>3</sup>); NH<sub>3</sub>-Ammonia (DL 5 µg/m<sup>3</sup>); Pb-Lead (DL 0.05 µg/m<sup>3</sup>); As-Arsenic (DL 0.1 ng/m<sup>3</sup>); Ni-Nickel (DL 0.5 ng/m<sup>3</sup>); Benzene-(DL 1 µg/m<sup>3</sup>); B(α)P- Benzo -α-pyrene(DL0.1 ng/m<sup>3</sup>); ng/m<sup>3</sup>: nanogram per cubic meter; µg/m<sup>3</sup> - microgram per cubic meter.

## CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

\*\*\*\*\*End of Report \*\*\*\*\*

Laboratory and Quality Manager: Authorized Signatory



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## TEST REPORT

Page 3 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	BERTH NO. 14 DOWN STREAM										
Sample Description	AAQ 3: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.07.2021										
Report No	HECS/A/015-021/070721										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

## RESULTS

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni
	μg/m <sup>3</sup>				mg/m <sup>3</sup>	μg/m <sup>3</sup>				ng/m <sup>3</sup>		
03.06.2021	10.9	14.5	40.7	22.5	0.14	BDL	11.5	BDL	BDL	BDL	BDL	BDL
07.06.2021	12.3	17.3	43.2	24.1	0.13	BDL	10.3	BDL	BDL	BDL	BDL	BDL
11.06.2021	11.3	16.9	41.6	21.9	0.14	BDL	10.2	BDL	BDL	BDL	BDL	BDL
14.06.2021	12.1	17.1	42.1	22.6	0.12	BDL	11.6	BDL	BDL	BDL	BDL	BDL
18.06.2021	13.2	18.6	43.2	24.1	0.19	BDL	13.6	BDL	BDL	BDL	BDL	BDL
21.06.2021	13.4	17.9	44.6	24.8	0.21	BDL	12.3	BDL	BDL	BDL	BDL	BDL
25.06.2021	13.7	18.7	45.3	25.5	0.23	BDL	13.1	BDL	BDL	BDL	BDL	BDL
28.06.2021	12.1	17.4	43.8	22.2	0.14	BDL	10.5	BDL	BDL	BDL	BDL	BDL
Min.	10.9	14.5	40.7	21.9	0.12	BDL	10.2	BDL	BDL	BDL	BDL	BDL
Max.	13.7	18.7	45.3	25.5	0.23	BDL	13.6	BDL	BDL	BDL	BDL	BDL
Avg.	12.4	17.3	43.1	23.5	0.2	BDL	11.6	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

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- O<sub>3</sub> : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
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## CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

\*\*\*\*\*End of Report \*\*\*\*\*

Laboratory and Quality Manager - Authorized Signatory



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### TEST REPORT

Page No. 1 of 1

Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Project Site/ Address	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Monitoring Description	<b>AMBIENT NOISE LEVEL</b>
Data Collected by	M/s. Hubert Enviro Care Systems Pvt Ltd.,
Date of Monitoring	25-26.06.2021
Report Date	29.06.2021
Report No	HECS/NM/001-005/260621

### RESULTS

Time (Hrs)/ Location	Berth No. 14	Project Site-North Side	Project Site-South Side	Project Site-East Side	Project Site-West Side
06.00	61.3	58.6	58.1	60.3	56.8
07.00	62.1	59.1	59.3	61.8	57.8
08.00	63.1	60.3	60.7	62.9	58.6
09.00	64.2	61.3	61.8	63.3	59.4
10.00	65.5	62.7	64.3	64.6	60.9
11.00	66.7	63.1	65.3	65.8	62.3
12.00	67.8	64.3	66.7	66.1	63.1
13.00	68.9	65.1	67.4	67.8	64.6
14.00	69.6	66.8	68.3	68.9	65.3
15.00	70.9	67.4	69.4	70.6	66.8
16.00	72.3	68.8	70.6	71.9	69.1
17.00	73.3	70.3	71.9	72.1	70.2
18.00	74.1	71.5	72.9	73.1	71.6
19.00	72.8	69.1	70.6	70.3	70.3
20.00	70.1	67.3	69.9	69.4	69.4
21.00	69.3	66.8	68.4	68.4	67.4
22.00	68.4	65.4	67.4	67.7	65.9
23.00	67.8	64.3	66.3	66.9	64.3
00.00	66.3	63.8	65.1	65.5	63.8
01.00	65.1	62.1	64.3	64.9	62.6
02.00	64.3	61.3	63.8	63.8	61.8
03.00	63.2	60.6	62.3	61.3	60.9
04.00	62.9	59.9	61.8	59.1	59.4
05.00	60.8	56.8	59.4	60.8	58.7
MIN	60.8	56.8	58.1	59.1	56.8
MAX	74.1	71.5	72.9	73.1	71.6
Day dB (A)	68.3	65.2	66.6	67.4	64.7
Night dB (A)	64.3	61.3	63.3	63.2	61.6

Limits: Industrial Area: Day Time-75 dB (A), Night Time-70 dB (A). Commercial Area: Day Time-65 dB (A), Night Time-55 dB (A). Residential Area: Day Time-55 dB (A), Night Time-45 dB (A). Silence Zone: Day Time-50 dB (A), Night Time-40 dB (A).

Note: Monitoring Date represents 24 hours from 6:00 am to 6:00 am next day. Legend: Leq- Equivalent Noise Level (hourly); Ld-Day Time Equivalent Noise Level (06:00-22:00 hrs); Ln-Night Time Equivalent Noise Level (22:00-06:00 hrs); and Ldn-24 hourly Equivalent Noise Level.

Reference: The Noise Pollution (Regulation and Control) Rules, 2000, CPCB, New Delhi.

ENVIRO CARE SYSTEMS  
AUTHORIZED SIGNATORY  
(Dr K Ganesan – Laboratory and Quality Manager)  
HUBERT ENVIRONMENTAL SERVICES LTD. \* HUEEE

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## TEST REPORT

Page No 1 of 1

Name of the Client	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Client	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Marine Water Monitoring
Sampling Mark	Jetty - Berth No. 14
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Sampling / Received Date	25.06.2021
Analysis Commenced On	25.06.2021
Analysis Completed On	09.07.2021
Report Date	10.07.2021
Report No	HECS/M/003/250621

S. No	Parameters	Test Method Followed	Units	Surface (1m Below surface)	Depth (20m from surface)	Tolerance Limit for harbour water Class SW – IV
1.	pH at 25°C	IS 3025 (Pt 11): 1983 (RA 2017)	-	7.85	7.77	6.5 - 9.0
2.	Colour	IS 3025 (Pt 4) :1983 (RA 2017)	Hazen	Colourless	Colourless	No visible colour
3.	Odour	IS 3025 (Pt 5):1983 (RA 2018)	-	Odourless	Odourless	No offensive odour
4.	Temperature	IS 3025 (Pt 09): 1983 (RA 2006)	°C	27	26	Not Provided
5.	EC at 25°C	IS:3025 (Pt-14): 2013	µS/cm	38000	38000	Not Provided
6.	TDS	IS 3025 (Pt 16): 1984 (RA 2017)	mg/L	23500	24300	Not Provided
7.	Turbidity	IS:3025 (Pt-10): 1984 (RA 2017)	NTU	3.9	3.1	Not Provided
8.	DO	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	4.9	4.3	3.0 mg/L or 40% saturation value whichever is higher
9.	BOD, 3 days at 27°C	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	BDL (DL 2)	BDL (DL 2)	5
10.	COD	IS 3025 (Part - 58):2006	mg/L	BDL (DL 20)	BDL (DL 20)	Not Provided
11.	Floating materials, Oil, grease and scum (including Petroleum products)	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	4.5	2.9	10
12.	Phosphates as P	IS 3025 (Part 31):1988	mg/L	0.31	0.28	Not Provided
13.	Nitrates as N	ASTM: (Part - 31)1978	mg/L	0.44	0.53	Not Provided
14.	Sulphates as SO <sub>4</sub>	IS 3025(Part - 24):1986	mg/L	2305	2285	Not Provided
15.	Chloride as Cl	IS 3025 (Part - 32):1988	mg/L	15800	15800	Not Provided
16.	Lead as Pb	IS 3025: (Part - 47)1994(Reaff 2009)	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Provided
17.	Mercury as Hg	IS 3025: (Part48):1994 RA 1999	mg/L	BDL (DL 0.001)	BDL(DL 0.001)	Not Provided
18.	Hexavalent Chromium as Cr <sup>+6</sup>	IS 3025 (Part - 52):2003	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Provided
19.	<i>Escherichia coli</i> (Faecal coli bacteria)	IS1622:1981 (RA 2009)	MPN/100mL	220	275	500/100 mL (MPN)
20.	Intestinal Enterococci ( <i>Streptococci</i> )	IS1622:1981 (RA 2009)	MPN/100mL	91	104	500/100 mL (MPN)

Note:-BDL - Below Detection Limit; DL- Detection Limit; µS/cm – micro Siemens per centimeter; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Litre;

MPN - Most Probable Number

Laboratory and Quality Manager



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### TEST REPORT

Page 01 of 01

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Sediment Quality Monitoring
Sampling Location	Berth No. 14, Container Yard
Sample Collected by	M/s Hubert Enviro Care Systems (P) Ltd.,
Sampling / Receipt date	25.06.2021
Analysis Commenced on	28.06.2021
Analysis Completed on	09.07.2021
Report Date	10.07.2021
Report No	HECS/S/001/280621

S.No.	Parameters	Units	Results	Test Method
1	Total Phosphorous	mg/kg	0.18	IS 10158 : 1982
2	Oil & Grease	mg/kg	2.7	USEPA Method
3	Nitrates	mg/kg	0.51	IS 14684 : 1999
4	Arsenic as As	mg/kg	0.81	USEPA Method
5	Lead as Pb	mg/kg	0.387	USEPA Method
6	Cadmium as Cd	mg/kg	0.48	USEPA Method
7	Mercury as Hg	mg/kg	BDL (DL 0.1)	USEPA Method
8	PAH	mg/kg	0.36	USEPA Method
9	Pesticides :			
i.	Phorate	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
ii.	<i>o,p</i> -DDT	mg/kg	0.04	USEPA Method 525.2: 1995
iii.	<i>p,p'</i> -DDT	mg/kg	0.074	USEPA Method 525.2: 1995
iv.	<i>o,p</i> -DDD	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
v.	<i>p,p'</i> -DDD	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
vi.	<i>o,p</i> -DDE	mg/kg	0.04	USEPA Method 525.2: 1995
vii.	<i>p,p'</i> -DDE	mg/kg	0.03	USEPA Method 525.2: 1995
viii.	$\alpha$ -Endosulphan	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
ix.	$\beta$ -Endosulphan	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
x.	Endosulphan Sulphate	mg/kg	0.083	USEPA Method 525.2: 1995
xi.	$\alpha$ - HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xii.	$\beta$ - HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xiii.	$\gamma$ -HCH	mg/kg	0.20	USEPA Method 525.2: 1995
xiv.	$\delta$ -HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xv.	Butachlor	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xvi.	Chlorpyrifos	mg/kg	0.04	USEPA Method 525.2: 1995
xvii.	Alachlor	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xviii.	Atrazine	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xix.	Aldrin	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xx.	Dieldrin	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xxi.	Ethion	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995

Note: - BDL - Below the Limit of Quantification; DL- Limit of Quantification; mg/kg- Milligrams per kilograms

Laboratory and Quality Manager - Authorized Signatory

(Dr K GANESAN)



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Certificate No. TC-5786

## TEST REPORT

Page 1 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	25.06.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.07.2021
Report No	HECS/BC/001/250621

## RESULTS

### Distribution of Phytoplankton (Nos./m<sup>3</sup>) in the sampled Berth No. 14

Phytoplankton	At Berth No. 14
<b>DIATOMS</b>	
<i>Coscinodiscus granii</i>	3462
<i>Coscinodiscus centralis</i>	1962
<i>Coscinodisdis marginatus</i>	1152
<i>Thalassiosira nitzschiooides</i>	2546
<i>Thalassiosira sp.</i>	997
<i>Thalassionema frauenfeldii</i>	100
<i>Thalassionema nitzschiooides</i>	160
<i>Thalassiothoursix sp.</i>	748
<i>Biddulphia mobilensis</i>	852
<i>Bacillaria spp.</i>	574
<i>Hemiaulus spp.</i>	5
<i>Chaetoceros affinis</i>	512
<i>Chaetoceros breve</i>	440
<i>Chaetoceros curvisetus</i>	284
<i>Ditylum spp.</i>	389
<i>Planktoniella sol</i>	310
<i>Leptocylindrus spp.</i>	92
<i>Melosira spp.</i>	3
<i>Rhizosolenia styliformis</i>	145
<i>Rhizosolenia alata</i>	21
<i>Rhizosolenia robusta</i>	19
<i>Skeletonema spp.</i>	6
<i>Nitzchia spp.</i>	334
<i>Fragillaria oceanica</i>	965
<i>Navicula spp.</i>	2912
<i>Pleurosigma spp.</i>	1012
<i>Stephanophysis spp.</i>	123
<i>Schoursoederella spp.</i>	3
<i>Odontella mobiliensis</i>	141
<i>Odontella spp.</i>	231

(Dr K Ganesan - Laboratory and Quality Manager)



**TEST REPORT**

Page 2 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	<b>Biological Parameters - Phytoplankton's, Zooplanktons &amp; Benthic Communities of Berth No. 14</b>
Sampling date & Receipt	25.06.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.07.2021
Report No	HECS/BC/001/250621

**RESULTS**

<b>DINOFLAGELLATES</b>	
Ceratium tripos	914
Ceratium furca	496
Ceratium fusus	144
Ceratium lunula	189
Peridinium depressum	263
Dinophysis spp.	3
Noctiluca spp.	151
Protoperidinium granii	1398
Protoperidinium sp.	546
<b>NANOPLANKTERS</b>	
Chlorella spp.	0
Total biomass (cc/m <sup>3</sup> )	0.443

**Phytoplankton community structure variability in the Berth No. 14**

Phytoplankton	S	N	d	J'	H' (log 2)
.	39	24604	3.35	0.81	4.02

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

(Dr K Ganesan - Laboratory and Quality Manager)



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**TEST REPORT**

Page 3 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	<b>Biological Parameters - Phytoplankton's, Zooplanktons &amp; Benthic Communities of Berth No. 14</b>
Sampling date & Receipt	25.06.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.07.2021
Report No	HECS/BC/001/250621

**RESULTS****Distribution of Zooplankton (Nos/m<sup>3</sup>) in the Berth No. 14**

	<b>Berth No. 14</b>
<b>Dinoflagellates</b>	
Noctiluca spp	110
<b>Ciliates</b>	
Tintinopsis	2201
<b>Protozoa</b>	
Radiolarians	1798
<b>Bryozoa</b>	
Bryozoan larvae	1680
<b>Cnidaria</b>	
Medusae	410
<b>Annelid</b>	
Polychaete larvae	330
<b>Urochordata (Tunicates)</b>	
Oikopleura	1123
<b>Brachiopoda</b>	
Brachiopod larvae	168
<b>Cladocera</b>	
Cladocera	2189
<b>Crustacea</b>	
Alima Larvae	184
Crustacean eggs	2954
Decapod	25721
Cypris larvae	5
Crab larvae	6
Lucifer	2412
Protozoa	300
Copepod	17300
Copepod Nauplius	18628
Nauplius	3
Barnacle Nauplius	2
<b>PISCES</b>	
Fish Egg	75
<b>HEXAPODA</b>	
Insect	2
Total biomass (cc/m <sup>3</sup> )	1.36

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Name of the Customer	<b>M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,</b>
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	<b>Biological Parameters - Phytoplankton's, Zooplanktons &amp; Benthic Communities of Berth No. 14</b>
Sampling date & Receipt	25.06.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.07.2021
Report No	HECS/BC/001/250621

**RESULTS****Zooplankton community structure variability in the berth No. 14**

Zooplankton	S	N	d	J'	H' (log 2)
Berth No. 14	22	77601	1.94	0.62	2.87

<b>S</b>	Total number of species (S)
<b>N</b>	Total number of individuals
<b>d</b>	Margalef's index
<b>J'</b>	Pielou's evenness index (J')
<b>H'(log 2)</b>	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	25.06.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.07.2021
Report No	HECS/BC/001/250621

**RESULTS**

**Distribution of benthos (Nos/m<sup>2</sup>) in the identified Berth No. 14**

	Berth No. 14
<b>CRUSTACEA</b>	
Amphipod	1
Isopods	2
Cumacea	94
Crustacean eggs	1350
Crustacean	3
Mysids	2
Egg mass	200
Brachyuran crabs	1400
<b>MOLLUSCA</b>	
Bivalves	277
Gastropods	280
<b>SCAPHOPODA</b>	
Dentalium	179
<b>FORAMINIFERA</b>	
Foraminifera	225
<b>CNIDARIA</b>	
Medusa	0
<b>ANNELIDA</b>	
Nereidae	211
Polychaetes	230
Spionidae	1410
<b>HYDROZOA</b>	
Hydrozoans	285
<b>Total biomass (g/m<sup>2</sup>)</b>	<b>140.2</b>

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**TEST REPORT**

Page 6 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	<b>Biological Parameters - Phytoplankton's, Zooplanktons &amp; Benthic Communities of Berth No. 14</b>
Sampling date & Receipt	25.06.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	10.07.2021
Report No	HECS/BC/001/250621

**RESULTS****Benthos community structure variability in the Berth No. 14**

Benthos	S	N	d	J'	H' (log 2)
Berth No. 14	16	6149	2.32	0.81	3.12

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

(Dr K Ganesan - Laboratory and Quality Manager)  

  
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## TEST REPORT

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,	Page 1 of 3
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.	
Sampling Location	CONTAINER YARD – PROJECT SITE	
Sample Description	AAQ 1: Ambient Air Quality Monitoring (24 hrs)	
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,	
Report Date	07.06.2021	
Report No	HECS/A/001/070621	
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini	

## RESULTS

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni
			μg/m <sup>3</sup>		mg/m <sup>3</sup>			μg/m <sup>3</sup>				
10.05.2021	14.6	21.3	51.3	25.6	0.18	BDL	11.3	BDL	BDL	BDL	BDL	BDL
14.05.2021	13.2	19.5	45.3	24.8	0.11	BDL	10.8	BDL	BDL	BDL	BDL	BDL
17.05.2021	15.4	20.6	46.8	25.2	0.16	BDL	11.6	BDL	BDL	BDL	BDL	BDL
21.05.2021	17.6	24.6	52.9	29.6	0.21	BDL	13.8	BDL	BDL	BDL	BDL	BDL
24.05.2021	18.4	25.8	53.4	30.1	0.29	BDL	14.6	BDL	BDL	BDL	BDL	BDL
28.05.2021	17.1	25.1	54.8	29.7	0.31	BDL	15.2	BDL	BDL	BDL	BDL	BDL
Min.	13.2	19.5	45.3	24.8	0.11	BDL	10.8	BDL	BDL	BDL	BDL	BDL
Max.	18.4	25.8	54.8	30.1	0.31	BDL	15.2	BDL	BDL	BDL	BDL	BDL
Avg.	16.1	22.8	50.8	27.5	0.20	BDL	12.9	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: \* 24 hours average; \*\* 8 hours average; \*\*\* Annual average

- PM<sub>10</sub> : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM<sub>2.5</sub> : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO<sub>2</sub> : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
- NO<sub>2</sub> : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O<sub>3</sub> : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH<sub>3</sub> : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C<sub>6</sub>H<sub>6</sub> : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM<sub>2.5</sub>-Particulate matter size less than 2.5 Micron, PM<sub>10</sub>-Particulate matter size less than 10 Micron; SO<sub>2</sub> Sulphur dioxide; NO<sub>2</sub> - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m<sup>3</sup>); O<sub>3</sub>-Ozone(DL 10 μg/m<sup>3</sup>); NH<sub>3</sub>-Ammonia (DL 5 μg/m<sup>3</sup>); Pb-Lead (DL 0.05 μg/m<sup>3</sup>); As-Arsenic (DL 0.1 ng/m<sup>3</sup>); Ni-Nickel (DL 0.5 ng/m<sup>3</sup>); Benzene- (DL 1 μg/m<sup>3</sup>); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m<sup>3</sup>); ng/m<sup>3</sup>: nanogram per cubic meter; μg/m<sup>3</sup> - microgram per cubic meter

## CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

\*\*\*\*\*End of Report \*\*\*\*\*

Laboratory and Quality Manager



- The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization
- Samples are not drawn by HECS unless or otherwise mentioned
- Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report.
- Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after involving or issue of test report.
- The test results relate only to the test items.

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### TEST REPORT

Page 1 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	CONTAINER YARD – PROJECT SITE										
Sample Description	AAQ 1: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.08.2021										
Report No	HECS/A/001-009/070821										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

### RESULTS

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni
	μg/m <sup>3</sup>				mg/m <sup>3</sup>	μg/m <sup>3</sup>				ng/m <sup>3</sup>		
01.07.2021	11.4	18.0	43.5	23.6	0.17	BDL	11.5	BDL	BDL	BDL	BDL	BDL
05.07.2021	12.8	18.3	42.1	20.1	0.15	BDL	10.6	BDL	BDL	BDL	BDL	BDL
08.07.2021	12.4	17.6	42.3	19.8	0.13	BDL	10.5	BDL	BDL	BDL	BDL	BDL
12.07.2021	12.6	17.8	41.8	20.3	0.12	BDL	10.3	BDL	BDL	BDL	BDL	BDL
15.07.2021	13.2	18.1	41.9	19.6	0.14	BDL	11.2	BDL	BDL	BDL	BDL	BDL
19.07.2021	13.6	19.6	42.3	21.6	0.22	BDL	12.5	BDL	BDL	BDL	BDL	BDL
22.07.2021	14.6	20.7	45.7	22.4	0.26	BDL	13.2	BDL	BDL	BDL	BDL	BDL
26.07.2021	15.2	21.4	46.5	23.4	0.31	BDL	13.5	BDL	BDL	BDL	BDL	BDL
29.07.2021	14.9	20.6	45.8	21.9	0.28	BDL	12.9	BDL	BDL	BDL	BDL	BDL
Min.	11.4	17.6	41.8	19.6	0.1	BDL	10.3	BDL	BDL	BDL	BDL	BDL
Max.	15.2	21.4	46.5	23.6	0.3	BDL	13.5	BDL	BDL	BDL	BDL	BDL
Avg.	13.4	19.1	43.5	21.4	0.2	BDL	11.8	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: \*: 24 hours average; \*\*: 8 hours average; \*\*\*: Annual average

#### Test Methods Followed:

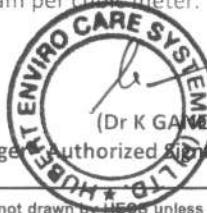
- PM<sub>10</sub> : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM<sub>2.5</sub> : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO<sub>2</sub> : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
- NO<sub>2</sub> : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O<sub>3</sub> : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH<sub>3</sub> : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C<sub>6</sub>H<sub>6</sub> : GC FID / GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM<sub>2.5</sub>-Particulate matter size less than 2.5 Micron, PM<sub>10</sub>-Particulate matter size less than 10 Micron; SO<sub>2</sub> Sulphur dioxide; NO<sub>2</sub> - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m<sup>3</sup>); O<sub>3</sub>-Ozone(DL 10 μg/m<sup>3</sup>); NH<sub>3</sub>-Ammonia (DL 5 μg/m<sup>3</sup>); Pb-Lead (DL 0.05 μg/m<sup>3</sup>); As-Arsenic (DL 0.1 ng/m<sup>3</sup>); Ni-Nickel (DL 0.5 ng/m<sup>3</sup>); Benzene-(DL 1 μg/m<sup>3</sup>); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m<sup>3</sup>); ng/m<sup>3</sup>: nanogram per cubic meter; μg/m<sup>3</sup> - microgram per cubic meter.

### CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

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Laboratory and Quality Manager Authorized Signatory



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HECS/Q/FMT/50

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## Laboratory Services Division

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ISO 9001, 14001 & OHSAS 18001 Certified.

Certificate No. TC-7920

### TEST REPORT

Page 2 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	BERTH NO. 14 UP STREAM										
Sample Description	AAQ 2: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.08.2021										
Report No	HECS/A/010-018/070821										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

### RESULTS

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni
	$\mu\text{g}/\text{m}^3$				mg/m <sup>3</sup>	$\mu\text{g}/\text{m}^3$				$\text{ng}/\text{m}^3$		
01.07.2021	10.4	15.6	42.0	20.2	0.12	BDL	11.0	BDL	BDL	BDL	BDL	BDL
05.07.2021	10.1	15.3	42.8	20.6	0.11	BDL	10.9	BDL	BDL	BDL	BDL	BDL
08.07.2021	9.6	14.6	40.6	19.5	0.10	BDL	10.1	BDL	BDL	BDL	BDL	BDL
12.07.2021	10.2	14.9	40.9	20.1	0.13	BDL	11.3	BDL	BDL	BDL	BDL	BDL
15.07.2021	10.4	15.4	42.6	21.6	0.17	BDL	11.6	BDL	BDL	BDL	BDL	BDL
19.07.2021	12.3	16.5	43.5	22.1	0.19	BDL	11.5	BDL	BDL	BDL	BDL	BDL
22.07.2021	12.6	17.3	44.2	23.7	0.23	BDL	12.5	BDL	BDL	BDL	BDL	BDL
26.07.2021	12.1	16.8	44.9	22.9	0.28	BDL	11.7	BDL	BDL	BDL	BDL	BDL
29.07.2021	12.5	16.4	43.4	21.8	0.25	BDL	11.2	BDL	BDL	BDL	BDL	BDL
Min.	9.6	14.6	40.6	19.5	0.1	BDL	10.1	BDL	BDL	BDL	BDL	BDL
Max.	12.6	17.3	44.9	23.7	0.3	BDL	12.5	BDL	BDL	BDL	BDL	BDL
Avg.	11.1	15.9	42.8	21.4	0.2	BDL	11.3	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: \* 24 hours average; \*\* 8 hours average; \*\*\* Annual average

#### Test Methods Followed:

- PM<sub>10</sub> : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM<sub>2.5</sub> : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO<sub>2</sub> : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
- NO<sub>2</sub> : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O<sub>3</sub> : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH<sub>3</sub> : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C<sub>6</sub>H<sub>6</sub> : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM<sub>2.5</sub>-Particulate matter size less than 2.5 Micron, PM<sub>10</sub>-Particulate matter size less than 10 Micron; SO<sub>2</sub> Sulphur dioxide; NO<sub>2</sub> - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m<sup>3</sup>); O<sub>3</sub>-Ozone(DL 10  $\mu\text{g}/\text{m}^3$ ); NH<sub>3</sub>-Ammonia (DL 5  $\mu\text{g}/\text{m}^3$ ); Pb-Lead (DL 0.05  $\mu\text{g}/\text{m}^3$ ); As-Arsenic (DL 0.1 ng/m<sup>3</sup>); Ni-Nickel (DL 0.5 ng/m<sup>3</sup>); Benzene-(DL 1  $\mu\text{g}/\text{m}^3$ ); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m<sup>3</sup>); ng/m<sup>3</sup>: nanogram per cubic meter;  $\mu\text{g}/\text{m}^3$  - microgram per cubic meter.

### CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

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Laboratory and Quality Manager Authorised Signatory



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Certificate No. TC-7920

### TEST REPORT

Page 3 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,											
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.											
Sampling Location	<b>BERTH NO. 14 DOWN STREAM</b>											
Sample Description	AAQ 3: Ambient Air Quality Monitoring (24 hrs)											
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,											
Report Date	07.08.2021											
Report No	HECS/A/019-027/070821											
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini											

### RESULTS

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni
$\mu\text{g}/\text{m}^3$												
01.07.2021	11.8	16.2	43.5	23.7	0.18	BDL	10.6	BDL	BDL	BDL	BDL	BDL
05.07.2021	11.3	15.6	41.2	22.1	0.13	BDL	11.2	BDL	BDL	BDL	BDL	BDL
08.07.2021	10.5	14.3	40.2	20.8	0.11	BDL	10.1	BDL	BDL	BDL	BDL	BDL
12.07.2021	11.2	14.9	39.4	21.1	0.12	BDL	10.6	BDL	BDL	BDL	BDL	BDL
15.07.2021	12.3	15.3	40.8	21.9	0.16	BDL	10.9	BDL	BDL	BDL	BDL	BDL
19.07.2021	12.9	16.8	41.3	22.3	0.18	BDL	11.6	BDL	BDL	BDL	BDL	BDL
22.07.2021	13.2	16.4	42.8	24.6	0.2	BDL	12.6	BDL	BDL	BDL	BDL	BDL
26.07.2021	12.8	17.1	43.5	24.1	0.22	BDL	12.1	BDL	BDL	BDL	BDL	BDL
29.07.2021	13.1	16.6	41.9	24.8	0.19	BDL	11.7	BDL	BDL	BDL	BDL	BDL
Min.	10.5	14.3	39.4	20.8	0.1	BDL	10.1	BDL	BDL	BDL	BDL	BDL
Max.	13.2	17.1	43.5	24.8	0.2	BDL	12.6	BDL	BDL	BDL	BDL	BDL
Avg.	12.1	15.9	41.6	22.8	0.2	BDL	11.3	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: \*: 24 hours average; \*\*: 8 hours average; \*\*\*: Annual average

#### Test Methods Followed:

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#### CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

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ISO 9001, 14001 & OHSAS 18001 Certified.

Certificate No. TC-7920

### TEST REPORT

Page No. 1 of 1

Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Project Site/ Address	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Monitoring Description	AMBIENT NOISE LEVEL
Data Collected by	M/s. Hubert Enviro Care Systems Pvt Ltd.,
Date of Monitoring	22-23.07.2021
Report Date	26.07.2021
Report No	HECS/NM/001-005/230721

### RESULTS

Time (Hrs)/ Location	Berth No. 14	Project Site-North Side	Project Site-South Side	Project Site-East Side	Project Site-West Side
06.00	62.6	62.7	63.1	63.8	61.4
07.00	63.1	63.2	64.3	64.3	61.7
08.00	63.9	63.6	65.1	65.5	62.2
09.00	64.9	64.3	65.6	66.3	63.2
10.00	65.2	64.8	66.2	67.4	64.3
11.00	65.9	65.1	66.8	68.2	66.5
12.00	66.4	65.5	67.3	68.7	67.6
13.00	67.8	66.1	67.9	69.8	68.5
14.00	68.2	66.9	68.1	70.6	69.9
15.00	69.1	67.8	68.7	71.7	70.6
16.00	71.6	69.8	69.9	72.6	71.1
17.00	72.3	71.3	71.1	73.8	71.8
18.00	73.8	72.5	70.6	74.6	72.3
19.00	73.1	72.1	69.4	73.6	71.4
20.00	72.6	71.3	69.1	72.5	70.8
21.00	72.3	70.6	68.8	72.1	68.4
22.00	71.6	70.2	68.3	70.5	67.5
23.00	71.2	69.7	67.3	69.4	65.3
00.00	69.8	67.8	66.8	68.8	64.5
01.00	68.4	65.3	66.3	66.7	63.6
02.00	66.4	64.3	65.5	65.4	62.8
03.00	65.3	62.8	64.8	63.3	61.7
04.00	63.8	62.1	64.3	62.6	60.3
05.00	61.8	61.5	62.8	62.1	59.6
MIN	61.8	61.5	62.8	62.1	59.6
MAX	73.8	72.5	71.1	74.6	72.3
Day dB (A)	68.5	67.5	67.7	69.8	67.6
Night dB (A)	66.7	64.8	65.4	65.5	62.5

Limits: Industrial Area: Day Time-75 dB (A), Night Time-70 dB (A). Commercial Area: Day Time-65 dB (A), Night Time-55 dB (A). Residential Area: Day Time-55 dB (A), Night Time-45 dB (A). Silence Zone: Day Time-50 dB (A), Night Time-40 dB (A).

Note: Monitoring Date represents 24 hours from 6:00 am to 6:00 am next day. Legend: Leq- Equivalent Noise Level (hourly); Ld-Day Time Equivalent Noise Level (06:00-22:00 hrs); Ln-Night Time Equivalent Noise Level (22:00-06:00 hrs); and Ldn-24 hourly Equivalent Noise Level.

Reference: The Noise Pollution (Regulation and Control) Rules, 2000, CPCB, New Delhi.

(Dr K Ganesan – Laboratory and Quality Manager)  
Authorized Signatory

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### TEST REPORT

Page No 1 of 1

Name of the Client	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Client	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	<b>Marine Water Monitoring</b>
Sampling Mark	<b>Jetty - Berth No. 14</b>
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Sampling / Received Date	22.07.2021
Analysis Commenced On	26.07.2021
Analysis Completed On	06.08.2021
Report Date	07.08.2021
Report No	HECS/M/003/260721

S. No	Parameters	Test Method Followed	Units	Surface (1m Below surface)	Depth (20m from surface)	Tolerance Limit for harbour water Class SW – IV
1.	pH at 25°C	IS 3025 (Pt 11): 1983 (RA 2017)	-	7.78	7.65	6.5 - 9.0
2.	Colour	IS 3025 (Pt 4) :1983 (RA 2017)	Hazen	Colourless	Colourless	No visible colour
3.	Odour	IS 3025 (Pt 5):1983 (RA 2018)	-	Odourless	Odourless	No offensive odour
4.	Temperature	IS 3025 (Pt 09): 1983 (RA 2006)	°C	26	25	Not Specified
5.	EC at 25°C	IS:3025 (Pt-14): 2013	µS/cm	37500	37500	Not Specified
6.	TDS	IS 3025 (Pt 16): 1984 (RA 2017)	mg/L	22600	23250	Not Specified
7.	Turbidity	IS:3025 (Pt-10): 1984 (RA 2017)	NTU	4.6	3.7	Not Specified
8.	DO	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	5.1	4.8	3.0 mg/L or 40% saturation value whichever is higher
9.	BOD, 3 days at 27°C	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	BDL (DL 2)	BDL (DL 2)	5
10.	COD	IS 3025 (Part - 58):2006	mg/L	BDL (DL 20)	BDL (DL 20)	Not Specified
11.	Floating materials, Oil, grease and scum (including Petroleum products)	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	5.2	3.1	10
12.	Phosphates as P	IS 3025 (Part 31):1988	mg/L	0.35	0.30	Not Specified
13.	Nitrates as N	ASTM: (Part - 31)1978	mg/L	0.48	0.61	Not Specified
14.	Sulphates as SO <sub>4</sub>	IS 3025(Part - 24):1986	mg/L	2209	2160	Not Specified
15.	Chloride as Cl	IS 3025 (Part - 32):1988	mg/L	13980	13980	Not Specified
16.	Lead as Pb	IS 3025: (Part - 47)1994(Reaff 2009)	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Specified
17.	Mercury as Hg	IS 3025: (Part48):1994 RA 1999	mg/L	BDL (DL 0.001)	BDL(DL 0.001)	Not Specified
18.	Hexavalent Chromium as Cr <sup>+6</sup>	IS 3025 (Part - 52):2003	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Specified
19.	<i>Escherichia coli</i> (Faecal coli bacteria)	IS1622:1981 (RA 2009)	MPN/100mL	210	267	500/100 mL (MPN)
20.	Intestinal Enterococci (Streptococci)	IS1622:1981 (RA 2009)	MPN/100mL	96	128	500/100 mL (MPN)

Note:-BDL - Below Detection Limit; DL- Detection Limit; µS/cm – micro Siemens per centimeter; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Litre;

MPN - Most Probable Number

Laboratory and Quality Manager



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Certificate No. TC-5786

**TEST REPORT**

Page 01 of 01

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,			
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.			
Sample Description	<b>Sediment Quality Monitoring</b>			
Sampling Location	<b>Berth No. 14, Container Yard</b>			
Sample Collected by	M/s Hubert Enviro Care Systems (P) Ltd.,			
Sampling / Receipt date	22.07.2021			
Analysis Commenced on	26.07.2021			
Analysis Completed on	05.08.2021			
Report Date	06.08.2021			
Report No	HECS/S/001/260721			

S.No.	Parameters	Units	Results	Test Method
1	Total Phosphorous	mg/kg	0.26	IS 10158 : 1982
2	Oil & Grease	mg/kg	3.2	USEPA Method
3	Nitrates	mg/kg	0.47	IS 14684 : 1999
4	Arsenic as As	mg/kg	0.74	USEPA Method
5	Lead as Pb	mg/kg	0.394	USEPA Method
6	Cadmium as Cd	mg/kg	0.41	USEPA Method
7	Mercury as Hg	mg/kg	BDL (DL 0.1)	USEPA Method
8	PAH	mg/kg	0.41	USEPA Method
9	Pesticides :			
i.	Phorate	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
ii.	<i>o,p</i> -DDT	mg/kg	0.06	USEPA Method 525.2: 1995
iii.	<i>p,p'</i> -DDT	mg/kg	0.081	USEPA Method 525.2: 1995
iv.	<i>o,p</i> -DDD	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
v.	<i>p,p'</i> -DDD	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
vi.	<i>o,p</i> -DDE	mg/kg	0.02	USEPA Method 525.2: 1995
vii.	<i>p,p'</i> -DDE	mg/kg	0.04	USEPA Method 525.2: 1995
viii.	$\alpha$ -Endosulphan	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
ix.	$\beta$ -Endosulphan	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
x.	Endosulphan Sulphate	mg/kg	0.076	USEPA Method 525.2: 1995
xi.	$\alpha$ - HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xii.	$\beta$ - HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xiii.	$\gamma$ -HCH	mg/kg	0.26	USEPA Method 525.2: 1995
xiv.	$\delta$ -HCH	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xv.	Butachlor	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xvi.	Chlorpyrifos	mg/kg	0.05	USEPA Method 525.2: 1995
xvii.	Alachlor	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xviii.	Atrazine	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xix.	Aldrin	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xx.	Dieldrin	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995
xxi.	Ethion	mg/kg	BDL (DL 0.01)	USEPA Method 525.2: 1995

Note: - BDL - Below the Limit of Quantification; DL- Limit of Quantification; mg/kg- Milligrams per kilograms

Laboratory and Quality Manager: Authorized Signature  
(Dr K GANESAN)



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**Laboratory Services Division**

(Chemical &amp; Biological Testing)

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FSSAI Notified Laboratory

ISO 9001, 14001 &amp; OHSAS 18001 Certified.

Certificate No. TC-5786

**TEST REPORT**

Page 1 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	22.07.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.08.2021
Report No	HECS/BC/001/220721

**RESULTS**Distribution of Phytoplankton (Nos./m<sup>3</sup>) in the sampled Berth No. 14

Phytoplankton	At Berth No. 14
<b>DIATOMS</b>	
<i>Coscinodiscus granii</i>	3591
<i>Coscinodiscus centralis</i>	2066
<i>Coscinodisdis marginatus</i>	1053
<i>Thalassiosira nitzschiooides</i>	2433
<i>Thalassiosira sp.</i>	1102
<i>Thalassionema frauenfeldii</i>	125
<i>Thalassionema nitzschiooides</i>	132
<i>Thalassiothoursix sp.</i>	687
<i>Biddulphia mobilensis</i>	840
<i>Bacillaria spp.</i>	600
<i>Hemiaulus spp.</i>	6
<i>Chaetoceros affinis</i>	608
<i>Chaetoceros breve</i>	400
<i>Chaetoceros curvisetus</i>	309
<i>Ditylum spp.</i>	412
<i>Planktoniella sol</i>	382
<i>Leptocylindrus spp.</i>	99
<i>Melosira spp.</i>	4
<i>Rhizosolenia styliformis</i>	153
<i>Rhizosolenia alata</i>	26
<i>Rhizosolenia robusta</i>	24
<i>Skeletonema spp.</i>	9
<i>Nitzchia spp.</i>	301
<i>Fragillaria oceanica</i>	1030
<i>Navicula spp.</i>	3052
<i>Pleurosigma spp.</i>	1152
<i>Stephanophysis spp.</i>	103
<i>Schoursoederella spp.</i>	4
<i>Odontella mobiliensis</i>	158
<i>Odontella spp.</i>	245

(Dr K Ganesan - Laboratory and Quality Manager)



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**TEST REPORT**

Page 2 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	22.07.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.08.2021
Report No	HECS/BC/001/220721

**RESULTS**

<b>DINOFLAGELLATES</b>	
<i>Ceratium tripos</i>	926
<i>Ceratium furca</i>	517
<i>Ceratium fusus</i>	155
<i>Ceratium lunula</i>	187
<i>Peridinium depressum</i>	254
<i>Dinophysis spp.</i>	2
<i>Noctiluca spp.</i>	140
<i>Protoperidinium granii</i>	1288
<i>Protoperidinium sp.</i>	558
<b>NANOPLANKTERS</b>	
<i>Chlorella spp.</i>	1
Total biomass (cc/m <sup>3</sup> )	0.671

**Phytoplankton community structure variability in the Berth No. 14**

Phytoplankton	S	N	d	J'	H' (log 2)
	40	25134	4.01	0.92	4.36

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		> 4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

(Dr K Ganesan - Laboratory and Quality Manager)



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### TEST REPORT

Page 3 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	22.07.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.08.2021
Report No	HECS/BC/001/220721

### RESULTS

#### Distribution of Zooplankton (Nos/m<sup>3</sup>) in the Berth No. 14

	Berth No. 14
<b>Dinoflagellates</b>	
Noctiluca spp	132
<b>Ciliates</b>	
Tintinopsis	2174
<b>Protozoa</b>	
Radiolarians	1856
<b>Bryozoa</b>	
Bryozoan larvae	1584
<b>Cnidaria</b>	
Medusae	512
<b>Annelid</b>	
Polychaete larvae	345
<b>Urochordata (Tunicates)</b>	
Oikopleura	1085
<b>Brachiopoda</b>	
Brachiopod larvae	178
<b>Cladocera</b>	
Ciadocera	2261
<b>Crustacea</b>	
Alima Larvae	199
Crustacean eggs	3065
Decapod	25321
Cypris larvae	4
Crab larvae	7
Lucifer	2561
Protozoea	312
Copepod	17450
Copepod Nauplius	18947
Nauplius	4
Barnacle Nauplius	1
<b>PISCES</b>	
Fish Egg	66
<b>HEXAPODA</b>	
Insect	1
Total biomass (cc/m <sup>3</sup> )	1.67

(Dr K Ganesan - Laboratory and Quality Manager)



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Page 4 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	22.07.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.08.2021
Report No	HECS/BC/001/220721

**RESULTS**

Zooplankton community structure variability in the berth No. 14

Zooplankton	S	N	d	J'	H' (log 2)
Berth No. 14	22	78065	3.53	0.89	4.61

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

(Dr K Ganesan - Laboratory Head and Quality Manager)

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**TEST REPORT**

Page 5 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	22.07.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.08.2021
Report No	HECS/BC/001/220721

**RESULTS****Distribution of benthos (Nos/m<sup>2</sup>) in the identified Berth No. 14**

	Berth No. 14
<b>CRUSTACEA</b>	
Amphipod	2
Isopods	0
Cumacea	110
Crustacean eggs	1456
Crustacean	2
Mysids	4
Egg mass	210
Brachyuran crabs	1504
<b>MOLLUSCA</b>	
Bivalves	321
Gastropods	264
<b>SCAPHOPODA</b>	
Dentalium	189
<b>FORAMINIFERA</b>	
Foraminifera	260
<b>CNIDARIA</b>	
Medusa	0
<b>ANNELIDA</b>	
Nereidae	287
Polychaetes	2201
Spionidae	1354
<b>HYDROZOA</b>	
Hydrozoans	264
<b>Total biomass (g/m<sup>2</sup>)</b>	<b>165.2</b>

(Dr K Ganesan - Laboratory and Quality Manager)



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**TEST REPORT**

Page 6 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	22.07.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.08.2021
Report No	HECS/BC/001/220721

**RESULTS****Benthos community structure variability in the Berth No. 14**

Benthos	S	N	d	J'	H' (log 2)
Berth No. 14	15	6428	3.75	0.95	4.14

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

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TC-5786

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### TEST REPORT

Page 1 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	CONTAINER YARD – PROJECT SITE										
Sample Description	AAQ 1: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.09.2021										
Report No	HECS/A/001-009/070921										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

### RESULTS

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni
	μg/m <sup>3</sup>				mg/m <sup>3</sup>	μg/m <sup>3</sup>				ng/m <sup>3</sup>		
02.08.2021	11.1	17.7	42.1	22.1	0.15	BDL	10.7	BDL	BDL	BDL	BDL	BDL
05.08.2021	11.8	18.1	40.9	21.3	0.12	BDL	11.3	BDL	BDL	BDL	BDL	BDL
09.08.2021	11.6	17.2	41.6	19.5	0.10	BDL	11.6	BDL	BDL	BDL	BDL	BDL
12.08.2021	12.1	16.9	42.1	20.1	0.15	BDL	11.4	BDL	BDL	BDL	BDL	BDL
16.08.2021	12.8	17.9	40.4	20.6	0.13	BDL	12.6	BDL	BDL	BDL	BDL	BDL
19.08.2021	13.7	18.4	41.8	19.3	0.17	BDL	13.4	BDL	BDL	BDL	BDL	BDL
23.08.2021	14.3	18.9	42.3	20.7	0.21	BDL	13.2	BDL	BDL	BDL	BDL	BDL
26.08.2021	14.9	20.4	42.8	21.4	0.24	BDL	12.3	BDL	BDL	BDL	BDL	BDL
30.08.2021	15.1	20.9	43.9	20.4	0.27	BDL	12.2	BDL	BDL	BDL	BDL	BDL
Min.	11.1	16.9	40.4	19.3	0.1	BDL	10.7	BDL	BDL	BDL	BDL	BDL
Max.	15.1	20.9	43.9	22.1	0.27	BDL	13.4	BDL	BDL	BDL	BDL	BDL
Avg.	13.0	18.5	42.0	20.6	0.20	BDL	12.1	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: \*: 24 hours average; \*\*: 8 hours average; \*\*\*: Annual average

#### Test Methods Followed:

- PM<sub>10</sub> : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM<sub>2.5</sub> : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO<sub>2</sub> : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
- NO<sub>2</sub> : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O<sub>3</sub> : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH<sub>3</sub> : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C<sub>6</sub>H<sub>6</sub> : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM<sub>2.5</sub>-Particulate matter size less than 2.5 Micron, PM<sub>10</sub>-Particulate matter size less than 10 Micron; SO<sub>2</sub> Sulphur dioxide; NO<sub>2</sub> - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m<sup>3</sup>); O<sub>3</sub>-Ozone(DL 10 μg/m<sup>3</sup>); NH<sub>3</sub>-Ammonia (DL 5 μg/m<sup>3</sup>); Pb-Lead (DL 0.05 μg/m<sup>3</sup>); As-Arsenic (DL 0.1 ng/m<sup>3</sup>); Ni-Nickel (DL 0.5 ng/m<sup>3</sup>); Benzene-(DL 1 μg/m<sup>3</sup>); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m<sup>3</sup>); ng/m<sup>3</sup>: nanogram per cubic meter, μg/m<sup>3</sup> - microgram per cubic meter.

### CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

\*\*\*\*\*End of Report\*\*\*\*\*

(Dr K GANESAN)

Laboratory and Quality Manager - Authorized Signatory

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## TEST REPORT

Page 2 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	<b>BERTH NO. 14 UP STREAM</b>										
Sample Description	AAQ 2: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.09.2021										
Report No	HECS/A/010-018/070921										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

## RESULTS

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni
	μg/m <sup>3</sup>					mg/m <sup>3</sup>				μg/m <sup>3</sup>		
02.08.2021	11.2	14.6	41.2	19.7	0.13	BDL	11.1	BDL	BDL	BDL	BDL	BDL
05.08.2021	9.8	14.8	40.8	20.1	0.11	BDL	10.2	BDL	BDL	BDL	BDL	BDL
09.08.2021	9.4	13.9	39.7	19.6	0.12	BDL	10.1	BDL	BDL	BDL	BDL	BDL
12.08.2021	9.1	14.5	39.4	20.2	0.10	BDL	10.0	BDL	BDL	BDL	BDL	BDL
16.08.2021	10.3	15.1	40.3	19.3	0.15	BDL	10.3	BDL	BDL	BDL	BDL	BDL
19.08.2021	9.3	14.2	41.8	20.4	0.17	BDL	10.8	BDL	BDL	BDL	BDL	BDL
23.08.2021	11.7	15.8	42.6	22.1	0.21	BDL	11.5	BDL	BDL	BDL	BDL	BDL
26.08.2021	11.1	16.1	42.1	21.9	0.24	BDL	12.1	BDL	BDL	BDL	BDL	BDL
30.08.2021	12.1	15.9	42.8	21.8	0.22	BDL	11.9	BDL	BDL	BDL	BDL	BDL
Min.	9.1	13.9	39.4	19.3	0.10	BDL	10.0	BDL	BDL	BDL	BDL	BDL
Max.	12.1	16.1	42.8	22.1	0.24	BDL	12.1	BDL	BDL	BDL	BDL	BDL
Avg.	10.4	15.0	41.2	20.6	0.20	BDL	10.9	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: \*: 24 hours average; \*\*: 8 hours average; \*\*\*: Annual average

### Test Methods Followed:

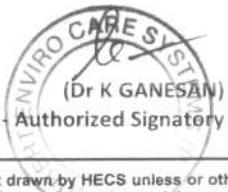
- PM<sub>10</sub> : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM<sub>2.5</sub> : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO<sub>2</sub> : IS 5182 (Pt 2): 2001 (RA 2017) (improved west and Geake method)
- NO<sub>2</sub> : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O<sub>3</sub> : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH<sub>3</sub> : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C<sub>6</sub>H<sub>6</sub> : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL = Below detection limit; DL - Detection Limit; PM<sub>2.5</sub>-Particulate matter size less than 2.5 Micron, PM<sub>10</sub>-Particulate matter size less than 10 Micron; SO<sub>2</sub> Sulphur dioxide; NO<sub>2</sub> - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m<sup>3</sup>); O<sub>3</sub>-Ozone(DL 10 μg/m<sup>3</sup>); NH<sub>3</sub>-Ammonia (DL 5 μg/m<sup>3</sup>); Pb-Lead (DL 0.05 μg/m<sup>3</sup>); As-Arsenic (DL 0.1 ng/m<sup>3</sup>); Ni-Nickel (DL 0.5 ng/m<sup>3</sup>); Benzene-(DL 1 μg/m<sup>3</sup>); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m<sup>3</sup>); ng/m<sup>3</sup>: nanogram per cubic meter; μg/m<sup>3</sup> - microgram per cubic meter.

### CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

\*\*\*\*\*End of Report \*\*\*\*\*

Laboratory and Quality Manager - Authorized Signatory



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TC-5786

## Laboratory Services Division

(Chemical & Biological Testing)

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### TEST REPORT

Page 3 of 3

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	BERTH NO. 14 DOWN STREAM										
Sample Description	AAQ 3: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	07.09.2021										
Report No	HECS/A/019-027/070921										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

### RESULTS

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni
	μg/m <sup>3</sup>				mg/m <sup>3</sup>	μg/m <sup>3</sup>				ng/m <sup>3</sup>		
02.08.2021	11.3	15.3	41.7	22.8	0.11	BDL	10.7	BDL	BDL	BDL	BDL	BDL
05.08.2021	10.9	14.8	39.7	20.4	0.13	BDL	10.6	BDL	BDL	BDL	BDL	BDL
09.08.2021	10.2	15.1	41.1	19.8	0.10	BDL	10.2	BDL	BDL	BDL	BDL	BDL
12.08.2021	10.1	14.7	39.8	19.4	0.12	BDL	10.4	BDL	BDL	BDL	BDL	BDL
16.08.2021	9.9	15.1	39.4	20.1	0.14	BDL	10.9	BDL	BDL	BDL	BDL	BDL
19.08.2021	10.5	15.9	40.5	22.1	0.18	BDL	11.4	BDL	BDL	BDL	BDL	BDL
23.08.2021	11.8	16.1	41.3	23.6	0.21	BDL	12.1	BDL	BDL	BDL	BDL	BDL
26.08.2021	12.1	15.8	42.1	22.7	0.19	BDL	12.3	BDL	BDL	BDL	BDL	BDL
30.08.2021	12.9	16.2	42.5	23.1	0.20	BDL	11.9	BDL	BDL	BDL	BDL	BDL
Min.	9.9	14.7	39.4	19.4	0.10	BDL	10.2	BDL	BDL	BDL	BDL	BDL
Max.	12.9	16.2	42.5	23.6	0.21	BDL	12.3	BDL	BDL	BDL	BDL	BDL
Avg.	11.1	15.4	40.9	21.6	0.20	BDL	11.2	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: \*: 24 hours average; \*\*: 8 hours average; \*\*\*: Annual average

#### Test Methods Followed:

PM<sub>10</sub> : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)

PM<sub>2.5</sub> : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)

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NH<sub>3</sub> : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)

CO : IS 5182 (Pt 10): 1999 (RA 2013)

Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)

C<sub>6</sub>H<sub>6</sub> : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)

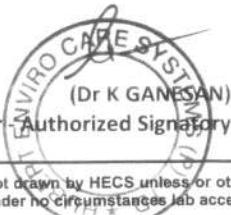
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BDL =Below detection limit; DL - Detection Limit; PM<sub>2.5</sub>-Particulate matter size less than 2.5 Micron, PM<sub>10</sub>-Particulate matter size less than 10 Micron; SO<sub>2</sub> Sulphur dioxide; NO<sub>2</sub> - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m<sup>3</sup>); O<sub>3</sub>-Ozone(DL 10 μg/m<sup>3</sup>); NH<sub>3</sub>-Ammonia (DL 5 μg/m<sup>3</sup>); Pb-Lead (DL 0.05 μg/m<sup>3</sup>); As-Arsenic (DL 0.1 ng/m<sup>3</sup>); Ni-Nickel (DL 0.5 ng/m<sup>3</sup>); Benzene-(DL 1 μg/m<sup>3</sup>); B(α)P- Benzo -α-pyrene(DL0.1 ng/m<sup>3</sup>); ng/m<sup>3</sup>: nanogram per cubic meter; μg/m<sup>3</sup> - microgram per cubic meter.

### CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS

\*\*\*\*\*End of Report \*\*\*\*\*

Laboratory and Quality Manager - Authorized Signatory



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### TEST REPORT

Page No. 1 of 1

Customer	M/s. JSW-MangaloreContainer Terminal Pvt. Ltd.,
Project Site/ Address	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Monitoring Description	<b>AMBIENT NOISE LEVEL</b>
Data Collected by	M/s. Hubert Enviro Care Systems Pvt Ltd.,
Date of Monitoring	24-25.08.2021
Report Date	28.08.2021
Report No	HECS/NM/001-005/250821

### RESULTS

Time (Hrs)/ Location	Berth No. 14	Project Site-North Side	Project Site-South Side	Project Site-East Side	Project Site-West Side
06.00	60.8	59.8	62.3	61.8	60.9
07.00	62.1	60.2	63.5	62.5	61.1
08.00	62.9	60.9	64.2	63.9	61.9
09.00	63.2	61.5	64.8	64.5	62.6
10.00	63.8	62.3	65.5	65.8	63.3
11.00	64.9	63.6	66.1	66.3	64.5
12.00	65.6	64.5	66.9	67.7	65.5
13.00	66.1	65.5	67.3	68.2	66.8
14.00	66.9	66.8	67.9	69.8	67.8
15.00	67.5	67.1	68.2	70.2	68.6
16.00	68.4	68.5	68.6	71.7	69.3
17.00	69.4	69.3	69.5	72.6	70.8
18.00	70.6	70.2	70.9	73.8	71.9
19.00	69.1	69.2	69.5	72.3	72.5
20.00	68.4	68.3	68.3	71.7	71.3
21.00	67.8	67.4	67.2	71.2	70.3
22.00	66.3	66.3	66.3	70.6	69.5
23.00	65.8	65.2	65.5	69.8	68.4
00.00	64.2	64.2	64.3	67.4	67.3
01.00	63.1	63.5	63.8	65.5	65.8
02.00	61.8	62.7	62.5	64.6	64.2
03.00	60.7	60.4	61.7	62.8	63.6
04.00	59.4	60.1	60.3	61.8	61.8
05.00	59.1	59.4	61.2	61.3	59.8
MIN	59.1	59.4	60.3	61.3	59.8
MAX	70.6	70.2	70.9	73.8	72.5
Day dB (A)	66.1	65.4	66.9	68.5	67.0
Night dB (A)	62.0	62.2	62.8	64.7	64.4

Limits: Industrial Area: Day Time-75 dB (A), Night Time-70 dB (A). Commercial Area: Day Time-65 dB (A), Night Time-55 dB (A). Residential Area: Day Time-55 dB (A), Night Time-45 dB (A). Silence Zone: Day Time-50 dB (A), Night Time-40 dB (A).

Note: Monitoring Date represents 24 hours from 6:00 am to 6:00am next day. Legend: Leq- Equivalent Noise Level (hourly); Ld-Day Time Equivalent Noise Level (06:00-22:00 hrs); Ln-Night Time Equivalent Noise Level (22:00-06:00 hrs); and Ldn-24 hourly Equivalent Noise Level.

Reference: The Noise Pollution (Regulation and Control) Rules, 2000, CPCB, New Delhi.

Authorized Signatory  
 (Dr K Ganesan – Laboratory and Quality Manager)

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### TEST REPORT

Page No 1 of 1

Name of the Client	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Client	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	<b>Marine Water Monitoring</b>
Sampling Mark	<b>Jetty - Berth No. 14</b>
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Sampling / Received Date	24.08.2021
Analysis Commenced On	24.08.2021
Analysis Completed On	06.09.2021
Report Date	07.09.2021
Report No	HECS/M/001/240821

S. No	Parameters	Test Method Followed	Units	Surface (1m Below surface)	Depth (20m from surface)	Tolerance Limit for harbour water Class SW – IV
1.	pH at 25°C	IS 3025 (Pt 11): 1983 (RA 2017)	-	7.73	7.58	6.5 - 9.0
2.	Colour	IS 3025 (Pt 4) :1983 (RA 2017)	Hazen	Colourless	Colourless	No visible colour
3.	Odour	IS 3025 (Pt 5):1983 (RA 2018)	-	Odourless	Odourless	No offensive odour
4.	Temperature	IS 3025 (Pt 09): 1983 (RA 2006)	°C	26	25	Not Specified
5.	EC at 25°C	IS:3025 (Pt-14): 2013	µS/cm	47000	47000	Not Specified
6.	TDS	IS 3025 (Pt 16): 1984 (RA 2017)	mg/L	23000	23325	Not Specified
7.	Turbidity	IS:3025 (Pt-10): 1984 (RA 2017)	NTU	1.8	2.9	Not Specified
8.	DO	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	6.2	5.3	3.0 mg/L or 40% saturation value whichever is higher
9.	BOD, 3 days at 27°C	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	BDL (DL 2)	BDL (DL 2)	5
10.	COD	IS 3025 (Part - 58):2006	mg/L	BDL (DL 20)	BDL (DL 20)	Not Specified
11.	Floating materials, Oil, grease and scum(including Petroleum products)	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	6.4	4.3	10
12.	Phosphates as P	IS 3025 (Part 31):1988	mg/L	0.46	0.41	Not Specified
13.	Nitrates as N	ASTM: (Part - 31)1978	mg/L	0.53	0.73	Not Specified
14.	Sulphates as SO <sub>4</sub>	IS 3025(Part - 24):1986	mg/L	4047	3986	Not Specified
15.	Chloride as Cl	IS 3025 (Part - 32):1988	mg/L	17920	17920	Not Specified
16.	Lead as Pb	IS 3025: (Part - 47)1994(Reaff 2009)	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Specified
17.	Mercury as Hg	IS 3025: (Part48):1994 RA 1999	mg/L	BDL (DL 0.001)	BDL (DL 0.001)	Not Specified
18.	Hexavalent Chromium as Cr <sup>+6</sup>	IS 3025 (Part - 52):2003	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Specified
19.	Escherichia coli (Faecal coli bacteria)	IS1622:1981 (RA 2009)	MPN/100mL	208	257	500/100 mL (MPN)
20.	Intestinal Enterococci (Streptococci)	IS1622:1981 (RA 2009)	MPN/100mL	102	132	500/100 mL (MPN)

Note:- BDL - Below Detection Limit; DL- Detection Limit, µS/cm – micro Siemens per centimeter; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Litre;

MPN - Most Probable Number

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### TEST REPORT

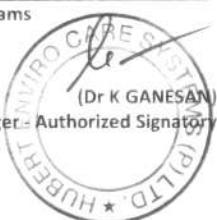
Page 01 of 01

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Sediment Quality Monitoring
Sampling Location	Berth No. 14, Container Yard
Sample Collected by	M/s Hubert Enviro Care Systems (P) Ltd.,
Sampling / Receipt date	24.08.2021
Analysis Commenced on	27.08.2021
Analysis Completed on	06.09.2021
Report Date	07.09.2021
Report No	HECS/S/001/240821

S.No.	Parameters	Units	Results	TestMethod
1	Total Phosphorous	mg/kg	0.20	IS 10158 : 1982
2	Oil & Grease	mg/kg	2.8	USEPA Method
3	Nitrates	mg/kg	0.51	IS 14684 : 1999
4	Arsenic as As	mg/kg	0.65	USEPA Method
5	Lead as Pb	mg/kg	0.381	USEPA Method
6	Cadmium as Cd	mg/kg	0.36	USEPA Method
7	Mercury as Hg	mg/kg	BDL(DL 0.1)	USEPA Method
8	PAH	mg/kg	0.34	USEPA Method
9	Pesticides :			
i.	Phorate	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
ii.	<i>o,p</i> -DDT	mg/kg	0.04	USEPA Method 525.2: 1995
iii.	<i>p,p'</i> -DDT	mg/kg	0.078	USEPA Method 525.2: 1995
iv.	<i>o,p</i> -DDD	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
v.	<i>p,p'</i> -DDD	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
vi.	<i>o,p</i> -DDE	mg/kg	0.03	USEPA Method 525.2: 1995
vii.	<i>p,p'</i> -DDE	mg/kg	0.05	USEPA Method 525.2: 1995
viii.	$\alpha$ -Endosulphan	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
ix.	$\beta$ -Endosulphan	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
x.	Endosulphan Sulphate	mg/kg	0.071	USEPA Method 525.2: 1995
xi.	$\alpha$ -HCH	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xii.	$\beta$ -HCH	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xiii.	$\gamma$ -HCH	mg/kg	0.21	USEPA Method 525.2: 1995
xiv.	$\delta$ -HCH	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xv.	Butachlor	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xvi.	Chlorpyrifos	mg/kg	0.04	USEPA Method 525.2: 1995
xvii.	Alachlor	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xviii.	Atrazine	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xix.	Aldrin	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xx.	Dieldrin	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xxi.	Ethion	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995

Note: - BDL - Below the Limit of Quantification; DL- Limit of Quantification; mg/kg- Milligrams per kilograms

(Dr K GANESAN)  
Laboratory and Quality Manager- Authorized Signatory



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### TEST REPORT

Page 1 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters -Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.08.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.09.2021
Report No	HECS/BC/001/240821

### RESULTS

Distribution of Phytoplankton (Nos./m<sup>3</sup>) in the sampled Berth No. 14

Phytoplankton	At Berth No. 14
<b>DIATOMS</b>	
<i>Coscinodiscus granii</i>	3626
<i>Coscinodiscus centralis</i>	2132
<i>Coscinodiscusmarginatus</i>	1023
<i>Thalassiosiranitzschiooides</i>	2354
<i>Thalassiosira sp.</i>	1098
<i>Thalassionemafrauenfeldii</i>	136
<i>Thalassionemanitzschiooides</i>	124
<i>Thalassiothoursix sp.</i>	702
<i>Biddulphiamobilensis</i>	789
<i>Bacillaria spp.</i>	621
<i>Hemiaulus spp.</i>	8
<i>Chaetocerosaffinis</i>	587
<i>Chaetoceros breve</i>	395
<i>Chaetoceroscurvisetus</i>	286
<i>Ditylum spp.</i>	400
<i>Planktoniella sol</i>	412
<i>Leptocylindrus spp.</i>	106
<i>Melosira spp.</i>	5
<i>Rhizosoleniastyliformis</i>	158
<i>Rhizosoleniaalata</i>	32
<i>Rhizosoleniarobusta</i>	29
<i>Skeletonema spp.</i>	12
<i>Nitzchia spp.</i>	321
<i>Fragillaria oceanica</i>	1054
<i>Navicula spp.</i>	3125
<i>Pleurosigma spp.</i>	1056
<i>Stephanophysisspp.</i>	128
<i>Schoursoederella spp.</i>	6
<i>Odontellamobiliensis</i>	150
<i>Odontella spp.</i>	231

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### TEST REPORT

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.08.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.09.2021
Report No	HECS/BC/001/240821

### RESULTS

DINOFLAGELLATES		
Ceratiumtripos		931
Ceratiumfurca		526
Ceratiumfusus		143
Ceratiumlunula		182
Peridiniumdepressum		247
Dinophysis spp.		3
Noctiluca spp.		156
Protoperidiniumgranii		1157
Protoperidinium sp.		560
NANOPLANKTERS		
Chlorella spp.		2
Total biomass (cc/m <sup>3</sup> )		0.702

### Phytoplankton community structure variability in the Berth No. 14

Phytoplankton	S	N	d	J'	H' (log 2)
	40	25013	3.95	0.84	4.20

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

Authorized Signatory  
(Dr K Ganesan - Laboratory and Quality Manager)



# Hubert Enviro Care Systems (P) Ltd.

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## Laboratory Services Division

(Chemical & Biological Testing)

Recognized by MoEF, BIS

FSSAI Notified Laboratory

ISO 9001, 14001 & OHSAS 18001 Certified.

### TEST REPORT

Page 3 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.08.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.09.2021
Report No	HECS/BC/001/240821

### RESULTS

#### Distribution of Zooplankton (Nos/m<sup>3</sup>) in the Berth No. 14

	Berth No. 14
<b>Dinoflagellates</b>	
Noctilucaspp	146
<b>Ciliates</b>	
Tintinopsis	2089
<b>Protozoa</b>	
Radiolarians	1945
<b>Bryozoa</b>	
Bryozoan larvae	1623
<b>Cnidaria</b>	
Medusae	602
<b>Annelid</b>	
Polychaete larvae	356
<b>Urochordata (Tunicates)</b>	
Oikopleura	1152
<b>Brachiopoda</b>	
Brachiopod larvae	208
Cladocera	2146
<b>Crustacea</b>	
Alima Larvae	187
Crustacean eggs	2988
Decapod	25698
Cypris larvae	3
Crab larvae	6
Lucifer	2468
Protozoea	300
Copepod	16890
Copepod Nauplius	18967
Nauplius	8
Barnacle Nauplius	4
<b>PISCES</b>	
Fish Egg	89
<b>HEXAPODA</b>	
Insect	3
Total biomass (cc/m <sup>3</sup> )	1.56

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### TEST REPORT

Page 4 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.08.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.09.2021
Report No	HECS/BC/001/240821

### RESULTS

#### Zooplankton community structure variability in the berth No. 14

Zooplankton	S	N	d	J'	H' (log 2)
Berth No. 14	22	77878	3.52	0.79	4.45

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

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### TEST REPORT

Page 5 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.08.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.09.2021
Report No	HECS/BC/001/240821

### RESULTS

#### Distribution of benthos (Nos/m<sup>2</sup>) in the identified Berth No. 14

	Berth No. 14
<b>CRUSTACEA</b>	
Amphipod	3
Isopods	4
Cumacea	107
Crustacean eggs	1398
Crustacean	3
Mysids	8
Egg mass	225
Brachyuran crabs	1623
<b>MOLLUSCA</b>	
Bivalves	300
Gastropods	254
<b>SCAPHOPODA</b>	
Dentalium	170
<b>FORAMINIFERA</b>	
Foraminifera	218
<b>CNIDARIA</b>	
Medusa	0
<b>ANNELIDA</b>	
Nereidae	217
Polychaetes	197
Spionidae	1389
<b>HYDROZOA</b>	
Hydrozoans	298
<b>Total biomass (g/m<sup>2</sup>)</b>	170.4

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### TEST REPORT

Page 6 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.08.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	07.09.2021
Report No	HECS/BC/001/240821

### RESULTS

#### Benthos community structure variability in the Berth No. 14

Benthos	S	N	d	J'	H' (log 2)
Berth No. 14	16	6414	3.63	0.80	3.97

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

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Certificate No. TC-5786

**TEST REPORT**

Page 1 of 1

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sampling Location	CONTAINER YARD – PROJECT SITE
Sample Description	AAQ 1: Ambient Air Quality Monitoring (24 hrs)
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Report Date	11.10.2021
Report No	HECS/A/001-009/111021
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini

**RESULTS**

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni
	μg/m <sup>3</sup>					mg/m <sup>3</sup>	μg/m <sup>3</sup>				ng/m <sup>3</sup>	
02.09.2021	12.6	18.9	43.6	23.6	0.12	BDL	13.8	BDL	BDL	BDL	BDL	BDL
06.09.2021	12.9	19.4	42.5	22.5	0.18	BDL	11.8	BDL	BDL	BDL	BDL	BDL
09.09.2021	13.2	19.3	42.6	20.9	0.11	BDL	12.3	BDL	BDL	BDL	BDL	BDL
13.09.2021	13.1	20.5	43.2	21.6	0.21	BDL	12.6	BDL	BDL	BDL	BDL	BDL
16.09.2021	13.7	19.3	42.2	22.5	0.23	BDL	12.4	BDL	BDL	BDL	BDL	BDL
20.09.2021	14.5	18.7	42.1	21.4	0.28	BDL	13.9	BDL	BDL	BDL	BDL	BDL
23.09.2021	14.4	20.6	44.2	23.8	0.22	BDL	13.6	BDL	BDL	BDL	BDL	BDL
27.09.2021	15.6	21.1	43.7	24.1	0.19	BDL	12.8	BDL	BDL	BDL	BDL	BDL
30.09.2021	15.4	20.8	42.8	23.3	0.27	BDL	14.1	BDL	BDL	BDL	BDL	BDL
Min.	12.6	18.7	42.1	20.9	0.11	BDL	11.8	BDL	BDL	BDL	BDL	BDL
Max.	15.6	21.1	44.2	24.1	0.28	BDL	14.1	BDL	BDL	BDL	BDL	BDL
Avg.	13.9	19.8	43.0	22.6	0.20	BDL	13.0	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: \*: 24 hours average; \*\*: 8 hours average; \*\*\*: Annual average

**Test Methods Followed:**PM<sub>10</sub> : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)PM<sub>2.5</sub> : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)SO<sub>2</sub> : IS 5182 (Pt 2): 2001 (RA 2017) (Improved wet and Geake method)NO<sub>2</sub> : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)O<sub>3</sub> : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)NH<sub>3</sub> : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)

CO : IS 5182 (Pt 10): 1999 (RA 2013)

Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)

C<sub>6</sub>H<sub>6</sub> : GC FID / GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)

B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM<sub>2.5</sub>-Particulate matter size less than 2.5 Micron, PM<sub>10</sub>-Particulate matter size less than 10 Micron; SO<sub>2</sub>- Sulphur dioxide; NO<sub>2</sub> - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m<sup>3</sup>); O<sub>3</sub>-Ozone(DL 10 μg/m<sup>3</sup>); NH<sub>3</sub>-Ammonia (DL 5 μg/m<sup>3</sup>); Pb-Lead (DL 0.05 μg/m<sup>3</sup>); As-Arsenic (DL 0.1 ng/m<sup>3</sup>); Ni-Nickel (DL 0.5 ng/m<sup>3</sup>); Benzene-(DL 1 μg/m<sup>3</sup>); B(α)P- Benzo -α-pyrene(DL 0.1 ng/m<sup>3</sup>); ng/m<sup>3</sup>: nanogram per cubic meter; μg/m<sup>3</sup> - microgram per cubic meter.

**CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS**

\*\*\*\*\*End of Report \*\*\*\*\*

Laboratory and Quality Manager - Authorized Signatory



- The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization
- Samples are not drawn by HECS unless otherwise mentioned
- Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report.
- Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report.
- The test results relate only to the test items.

HECS/Q/FMT/50

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Certificate No. TC-5786

**TEST REPORT**

Page 1 of 1

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,											
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.											
Sampling Location	<b>BERTH NO. 14 UP STREAM</b>											
Sample Description	AAQ 2: Ambient Air Quality Monitoring (24 hrs)											
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,											
Report Date	11.10.2021											
Report No	HECS/A/010-018/111021											
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini											

**RESULTS**

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni
	μg/m <sup>3</sup>				mg/m <sup>3</sup>	μg/m <sup>3</sup>				ng/m <sup>3</sup>		
02.09.2021	12.3	15.2	42.6	20.6	0.16	BDL	12.3	BDL	BDL	BDL	BDL	BDL
06.09.2021	11.6	15.9	42.1	19.6	0.18	BDL	11.6	BDL	BDL	BDL	BDL	BDL
09.09.2021	12.7	14.6	42.4	20.9	0.15	BDL	12.4	BDL	BDL	BDL	BDL	BDL
13.09.2021	12.3	14.2	43.2	21.3	0.19	BDL	11.3	BDL	BDL	BDL	BDL	BDL
16.09.2021	12.9	15.4	42.8	20.8	0.21	BDL	10.9	BDL	BDL	BDL	BDL	BDL
20.09.2021	13.2	14.1	43.6	21.3	0.24	BDL	11.8	BDL	BDL	BDL	BDL	BDL
23.09.2021	13.6	16.1	43.1	23.1	0.28	BDL	12.1	BDL	BDL	BDL	BDL	BDL
27.09.2021	12.5	16.2	42.8	22.9	0.22	BDL	11.6	BDL	BDL	BDL	BDL	BDL
30.09.2021	13.4	15.8	41.9	22.6	0.17	BDL	12.5	BDL	BDL	BDL	BDL	BDL
Min.	11.6	14.1	41.9	19.6	0.15	BDL	10.9	BDL	BDL	BDL	BDL	BDL
Max.	13.6	16.2	43.6	23.1	0.28	BDL	12.5	BDL	BDL	BDL	BDL	BDL
Avg.	12.7	15.3	42.7	21.5	0.20	BDL	11.8	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: \*: 24 hours average; \*\*: 8 hours average; \*\*\*: Annual average

**Test Methods Followed:**

- PM<sub>10</sub> : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM<sub>2.5</sub> : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- SO<sub>2</sub> : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
- NO<sub>2</sub> : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
- O<sub>3</sub> : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
- NH<sub>3</sub> : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C<sub>6</sub>H<sub>6</sub> : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM<sub>2.5</sub>-Particulate matter size less than 2.5 Micron, PM<sub>10</sub>-Particulate matter size less than 10 Micron; SO<sub>2</sub> Sulphur dioxide; NO<sub>2</sub> - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m<sup>3</sup>); O<sub>3</sub>-Ozone(DL 10 μg/m<sup>3</sup>); NH<sub>3</sub>-Ammonia (DL 5 μg/m<sup>3</sup>); Pb-Lead (DL 0.05 μg/m<sup>3</sup>); As-Arsenic (DL 0.1 ng/m<sup>3</sup>); Ni-Nickel (DL 0.5 ng/m<sup>3</sup>); Benzene-(DL 1 μg/m<sup>3</sup>); B(α)P- Benzo- α-pyrene(DL 0.1 ng/m<sup>3</sup>); ng/m<sup>3</sup>: nanogram per cubic meter; μg/m<sup>3</sup> - microgram per cubic meter.

**CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS**

\*\*\*\*\*End of Report \*\*\*\*\*

Laboratory and Quality Manager - Authorized Signatory

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**TEST REPORT**

Page 1 of 1

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,										
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.										
Sampling Location	<b>BERTH NO. 14 DOWN STREAM</b>										
Sample Description	AAQ 3: Ambient Air Quality Monitoring (24 hrs)										
Sample Collected by	M/s. Hubert Enviro Care Systems (P) Ltd.,										
Report Date	11.10.2021										
Report No	HECS/A/019-027/111021										
Instruments Used	Envirotech APM 460 brushless RDS & Envirotech APN 550 mini										

**RESULTS**

Date of Sampling	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	Pb	O <sub>3</sub>	NH <sub>3</sub>	C <sub>6</sub> H <sub>6</sub>	B(α)P	As	Ni
	μg/m <sup>3</sup>				mg/m <sup>3</sup>	μg/m <sup>3</sup>				ng/m <sup>3</sup>		
02.09.2021	13.2	16.3	42.9	23.1	0.20	BDL	11.3	BDL	BDL	BDL	BDL	BDL
06.09.2021	12.6	15.4	43.3	21.6	0.18	BDL	12.1	BDL	BDL	BDL	BDL	BDL
09.09.2021	11.8	16.1	42.6	23.2	0.12	BDL	11.6	BDL	BDL	BDL	BDL	BDL
13.09.2021	12.4	15.7	42.4	20.9	0.21	BDL	12.3	BDL	BDL	BDL	BDL	BDL
16.09.2021	13.1	15.5	43.1	21.5	0.19	BDL	12.8	BDL	BDL	BDL	BDL	BDL
20.09.2021	11.6	15.3	41.8	22.7	0.23	BDL	11.6	BDL	BDL	BDL	BDL	BDL
23.09.2021	12.2	16.2	42.9	23.9	0.17	BDL	12.4	BDL	BDL	BDL	BDL	BDL
27.09.2021	11.9	15.2	42.2	22.4	0.25	BDL	12.9	BDL	BDL	BDL	BDL	BDL
30.09.2021	12.5	15.1	43.4	22.9	0.22	BDL	12.1	BDL	BDL	BDL	BDL	BDL
Min.	11.6	15.1	41.8	20.9	0.12	BDL	11.3	BDL	BDL	BDL	BDL	BDL
Max.	13.2	16.3	43.4	23.9	0.25	BDL	12.9	BDL	BDL	BDL	BDL	BDL
Avg.	12.4	15.6	42.7	22.5	0.20	BDL	12.1	BDL	BDL	BDL	BDL	BDL
NAAQ Standards	80*	80*	100*	60*	2**	1*	100**	400*	5***	1***	6***	20***

Note: \*: 24 hours average; \*\*: 8 hours average; \*\*\*: Annual average

**Test Methods Followed:**

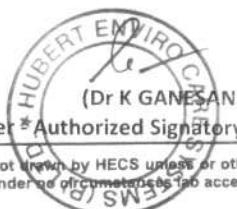
- PM<sub>10</sub> : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
- PM<sub>2.5</sub> : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
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- NH<sub>3</sub> : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
- CO : IS 5182 (Pt 10): 1999 (RA 2013)
- Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
- C<sub>6</sub>H<sub>6</sub> : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
- B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM<sub>2.5</sub>-Particulate matter size less than 2.5 Micron, PM<sub>10</sub>-Particulate matter size less than 10 Micron; SO<sub>2</sub> Sulphur dioxide; NO<sub>2</sub> - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m<sup>3</sup>); O<sub>3</sub>-Ozone(DL 10 μg/m<sup>3</sup>); NH<sub>3</sub>-Ammonia (DL 5 μg/m<sup>3</sup>); Pb-Lead (DL 0.05 μg/m<sup>3</sup>); As-Arsenic (DL 0.1 ng/m<sup>3</sup>); Ni-Nickel (DL 0.5 ng/m<sup>3</sup>); Benzene-(DL 1 μg/m<sup>3</sup>); B(α)P- Benzo-α-pyrene(DL 0.1 ng/m<sup>3</sup>); ng/m<sup>3</sup>: nanogram per cubic meter; μg/m<sup>3</sup> - microgram per cubic meter.

**CONCLUSION: ANALYSED PARAMETERS MEET THE NAAQ STANDARDS**

\*\*\*\*\*End of Report \*\*\*\*\*

Laboratory and Quality Manager \* Authorized Signatory



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HECS/Q/FMT/50

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Certificate No. TC-5786

### TEST REPORT

Page No. 1 of 1

Customer	M/s. JSW-MangaloreContainer Terminal Pvt. Ltd.,
Project Site/ Address	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Monitoring Description	AMBIENT NOISE LEVEL
Data Collected by	M/s. Hubert Enviro Care Systems Pvt Ltd.,
Date of Monitoring	24-25.09.2021
Report Date	28.09.2021
Report No	HECS/NM/001-005/250921

### RESULTS

Time (Hrs)/ Location	Berth No. 14	Project Site-North Side	Project Site-South Side	Project Site-East Side	Project Site-West Side
06.00	61.9	58.9	61.9	62.3	61.2
07.00	62.3	59.6	62.9	63.6	62.3
08.00	63.6	60.6	63.1	64.5	63.5
09.00	64.8	61.2	64.5	65.5	64.5
10.00	65.2	62.8	65.6	66.9	64.9
11.00	66.3	63.2	66.8	67.7	65.5
12.00	67.4	64.6	67.5	68.2	66.8
13.00	68.5	65.5	68.9	69.1	67.9
14.00	69.1	67.8	69.5	70.2	68.8
15.00	70.2	68.3	70.2	71.3	69.2
16.00	71.2	69.8	70.9	72.4	70.2
17.00	71.9	70.3	71.5	73.1	71.6
18.00	72.1	71.9	72.3	74.2	72.5
19.00	71.1	70.1	71.2	72.4	70.6
20.00	70.6	68.9	70.6	71.8	69.5
21.00	69.5	66.5	69.3	70.2	68.3
22.00	68.2	64.3	68.4	68.4	67.3
23.00	67.2	64.1	67.5	66.2	66.9
00.00	66.3	63.2	66.3	64.3	65.5
01.00	65.1	62.8	65.4	63.4	64.3
02.00	64.8	61.9	64.3	62.9	63.8
03.00	63.2	60.1	62.8	62.1	62.6
04.00	61.8	59.4	61.3	61.8	60.3
05.00	60.3	58.6	60.9	60.8	59.2
MIN	60.3	58.6	60.9	60.8	59.2
MAX	72.1	71.9	72.3	74.2	72.5
Day dB (A)	67.9	65.5	67.9	68.9	67.3
Night dB (A)	64.1	61.4	64.1	63.1	63.2

Limits: Industrial Area: Day Time-75 dB (A), Night Time-70 dB (A). Commercial Area: Day Time-65 dB (A), Night Time-55 dB (A). Residential Area: Day Time-55 dB (A), Night Time-45 dB (A). Silence Zone: Day Time-50 dB (A), Night Time-40 dB (A).

Note: Monitoring Date represents 24 hours from 6:00 am to 6:00am next day. Legend: Leq- Equivalent Noise Level (hourly); Ld-Day Time Equivalent Noise Level (06:00-22:00 hrs); Ln-Night Time Equivalent Noise Level (22:00-06:00 hrs); and Ldn-24 hourly Equivalent Noise Level.

Reference: The Noise Pollution (Regulation and Control) Rules, 2000, CPCB, New Delhi.

  
 \* Authorized Signatory  
 (Dr K Ganesan – Laboratory and Quality Manager)

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### TEST REPORT

Page No 1 of 1

Name of the Client	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Client	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	<b>Marine Water Monitoring</b>
Sampling Mark	<b>Jetty - Berth No. 14</b>
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Sampling / Received Date	24.09.2021
Analysis Commenced On	24.09.2021
Analysis Completed On	11.10.2021
Report Date	12.10.2021
Report No	HECS/M/001/240921

S. No	Parameters	Test Method Followed	Units	Surface (1m Below surface)	Depth (20m from surface)	Tolerance Limit for harbour water Class SW – IV
1.	pH at 25°C	IS 3025 (Pt 11): 1983 (RA 2017)	-	7.65	7.43	6.5 - 9.0
2.	Colour	IS 3025 (Pt 4) :1983 (RA 2017)	Hazen	Colourless	Colourless	No visible colour
3.	Odour	IS 3025 (Pt 5):1983 (RA 2018)	-	Odourless	Odourless	No offensive odour
4.	Temperature	IS 3025 (Pt 09): 1983 (RA 2006)	°C	27	26	Not Specified
5.	EC at 25°C	IS:3025 (Pt-14): 2013	µS/cm	48000	48000	Not Specified
6.	TDS	IS 3025 (Pt 16): 1984 (RA 2017)	mg/L	24000	24800	Not Specified
7.	Turbidity	IS:3025 (Pt-10): 1984 (RA 2017)	NTU	1.9	3.2	Not Specified
8.	DO	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	6.1	5.2	3.0 mg/L or 40% saturation value whichever is higher
9.	BOD, 3 days at 27°C	IS 3025 (Pt 44): 1993 (RA 2014)	mg/L	BDL (DL 2)	BDL (DL 2)	5
10.	COD	IS 3025 (Part - 58):2006	mg/L	BDL (DL 20)	BDL (DL 20)	Not Specified
11.	Floating materials, Oil, grease and scum(including Petroleum products)	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	7.1	3.9	10
12.	Phosphates as P	IS 3025 (Part 31):1988	mg/L	0.52	0.48	Not Specified
13.	Nitrates as N	ASTM: (Part - 31)1978	mg/L	0.62	0.76	Not Specified
14.	Sulphates as SO <sub>4</sub>	IS 3025(Part - 24):1986	mg/L	4232	4011	Not Specified
15.	Chloride as Cl	IS 3025 (Part - 32):1988	mg/L	18241	18241	Not Specified
16.	Lead as Pb	IS 3025: (Part - 47)1994(Reaff 2009)	mg/L	BDL(DL 0.01)	BDL(DL 0.01)	Not Specified
17.	Mercury as Hg	IS 3025: (Part48):1994 RA 1999	mg/L	BDL(DL 0.001)	BDL(DL 0.001)	Not Specified
18.	Hexavalent Chromium as Cr <sup>+6</sup>	IS 3025 (Part - 52):2003	mg/L	BDL (DL 0.01)	BDL (DL 0.01)	Not Specified
19.	Escherichia coli (Faecal coli bacteria)	IS1622:1981 (RA 2009)	MPN/100mL	203	241	500/100 mL (MPN)
20.	Intestinal Enterococci (Streptococci)	IS1622:1981 (RA 2009)	MPN/100mL	108	128	500/100 mL (MPN)

Note:- BDL - Below Detection Limit; DL- Detection Limit; µS/cm – micro Siemens per centimeter; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Litre;  
MPN - Most Probable Number

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**TEST REPORT**

Page 01 of 01

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Sediment Quality Monitoring
Sampling Location	Berth No. 14, Container Yard
Sample Collected by	M/s Hubert Enviro Care Systems (P) Ltd.,
Sampling / Receipt date	24.09.2021
Analysis Commenced on	27.09.2021
Analysis Completed on	11.10.2021
Report Date	12.10.2021
Report No	HECS/S/001/240921

S.No.	Parameters	Units	Results	TestMethod
1	Total Phosphorous	mg/kg	0.23	IS 10158 : 1982
2	Oil & Grease	mg/kg	3.2	USEPA Method
3	Nitrates	mg/kg	0.59	IS 14684 : 1999
4	Arsenic as As	mg/kg	0.53	USEPA Method
5	Lead as Pb	mg/kg	0.412	USEPA Method
6	Cadmium as Cd	mg/kg	0.32	USEPA Method
7	Mercury as Hg	mg/kg	BDL(DL 0.1)	USEPA Method
8	PAH	mg/kg	0.33	USEPA Method
9	Pesticides :			
i.	Phorate	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
ii.	<i>o,p</i> -DDT	mg/kg	0.03	USEPA Method 525.2: 1995
iii.	<i>p,p'</i> -DDT	mg/kg	0.082	USEPA Method 525.2: 1995
iv.	<i>o,p</i> -DDD	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
v.	<i>p,p'</i> -DDD	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
vi.	<i>o,p</i> -DDE	mg/kg	0.04	USEPA Method 525.2: 1995
vii.	<i>p,p'</i> -DDE	mg/kg	0.06	USEPA Method 525.2: 1995
viii.	$\alpha$ -Endosulphan	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
ix.	$\beta$ -Endosulphan	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
x.	Endosulphan Sulphate	mg/kg	0.065	USEPA Method 525.2: 1995
xi.	$\alpha$ - HCH	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xii.	$\beta$ - HCH	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xiii.	$\gamma$ -HCH	mg/kg	0.29	USEPA Method 525.2: 1995
xiv.	$\delta$ -HCH	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xv.	Butachlor	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xvi.	Chlorpyrifos	mg/kg	0.05	USEPA Method 525.2: 1995
xvii.	Alachlor	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xviii.	Atrazine	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xix.	Aldrin	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xx.	Dieldrin	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995
xxi.	Ethion	mg/kg	BDL(DL 0.01)	USEPA Method 525.2: 1995

Note:- BDL - Below the Limit of Quantification; DL- Limit of Quantification; mg/kg- Milligrams per kilograms

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**TEST REPORT**

Page 1 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	<b>Biological Parameters -Phytoplankton's, Zooplanktons &amp; Benthic Communities of Berth No. 14</b>
Sampling date & Receipt	24.09.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	16.10.2021
Report No	HECS/BC/001/240921

**RESULTS****Distribution of Phytoplankton (Nos./m<sup>3</sup>) in the sampled Berth No. 14**

<b>Phytoplankton</b>	<b>At Berth No. 14</b>
<b>DIATOMS</b>	
<i>Coscinodiscus granii</i>	3725
<i>Coscinodiscus centralis</i>	2215
<i>Coscinodiscus marginatus</i>	986
<i>Thalassiosira nitzschioides</i>	2452
<i>Thalassiosira sp.</i>	1111
<i>Thalassionema frauenfeldii</i>	125
<i>Thalassionema nitzschioides</i>	114
<i>Thalassiothrix sp.</i>	803
<i>Biddulphia mobilensis</i>	805
<i>Bacillaria spp.</i>	625
<i>Hemiaulus spp.</i>	10
<i>Chaetoceros affinis</i>	600
<i>Chaetoceros breve</i>	400
<i>Chaetoceros curvisetus</i>	302
<i>Ditylum spp.</i>	408
<i>Planktoniella sol</i>	425
<i>Leptocylindrus spp.</i>	110
<i>Melosira spp.</i>	8
<i>Rhizosolenia styliformis</i>	160
<i>Rhizosolenia alata</i>	36
<i>Rhizosolenia robusta</i>	32
<i>Skeletanema spp.</i>	13
<i>Nitzchia spp.</i>	325
<i>Fragillaria oceanica</i>	1056
<i>Navicula spp.</i>	3225
<i>Pleurosigma spp.</i>	1152
<i>Stephanophysis spp.</i>	142
<i>Schoursoederella spp.</i>	10
<i>Odontella mobiliensis</i>	158
<i>Odontella spp.</i>	239

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**TEST REPORT**

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.09.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	16.10.2021
Report No	HECS/BC/001/240921

**RESULTS**

**DINOFLAGELLATES**

<i>Ceratiumtripos</i>	1002
<i>Ceratiumfurca</i>	625
<i>Ceratiumfusus</i>	136
<i>Ceratiumlunula</i>	190
<i>Peridiniumdepressum</i>	269
<i>Dinophysis spp.</i>	2
<i>Noctiluca spp.</i>	111
<i>Protoperidiniumgranii</i>	1121
<i>Protoperidinium sp.</i>	594
<b>NANOPLANKTERS</b>	
<i>Chlorella spp.</i>	3
Total biomass (cc/m <sup>3</sup> )	0.734

**Phytoplankton community structure variability in the Berth No. 14**

Phytoplankton	S	N	d	J'	H' (log 2)
	40	25825	4.23	0.96	4.51

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

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## TEST REPORT

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Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	<b>Biological Parameters - Phytoplankton's, Zooplanktons &amp; Benthic Communities of Berth No. 14</b>
Sampling date & Receipt	24.09.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	16.10.2021
Report No	HECS/BC/001/240921

## RESULTS

### Distribution of Zooplankton (Nos/m<sup>3</sup>) in the Berth No. 14

	Berth No. 14
<b>Dinoflagellates</b>	
Noctilucaspp	162
<b>Ciliates</b>	
Tintinopsis	2185
<b>Protozoa</b>	
Radiolarians	1963
<b>Bryozoa</b>	
Bryozoan larvae	1685
<b>Cnidaria</b>	
Medusae	632
<b>Annelid</b>	
Polychaete larvae	344
<b>Urochordata (Tunicates)</b>	
Oikopleura	1121
<b>Brachiopoda</b>	
Brachiopod larvae	218
Cladocera	2256
<b>Crustacea</b>	
Alima Larvae	139
Crustacean eggs	2925
Decapod	25789
Cypris larvae	6
Crab larvae	10
Lucifer	2563
Protozoea	398
Copepod	16952
Copepod Nauplius	18856
Nauplius	10
Barnacle Nauplius	6
<b>PISCES</b>	
Fish Egg	95
<b>HEXAPODA</b>	
Insect	6
Total biomass (cc/m <sup>3</sup> )	1.83

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**TEST REPORT**

Page 4 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	<b>Biological Parameters - Phytoplankton's, Zooplanktons &amp; Benthic Communities of Berth No. 14</b>
Sampling date & Receipt	24.09.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	16.10.2021
Report No	HECS/BC/001/240921

**RESULTS****Zooplankton community structure variability in the berth No. 14**

Zooplankton	S	N	d	J'	H' (log 2)
Berth No. 14	22	78321	3.85	0.92	4.87

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
- Poor		2-1
Bad		1-0

(Dr K Ganesan - Laboratory and Quality Manager)



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**TEST REPORT**

Page 5 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.09.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	16.10.2021
Report No	HECS/BC/001/240921

**RESULTS**

**Distribution of benthos (Nos/m<sup>2</sup>) in the identified Berth No. 14**

	Berth No. 14
<b>CRUSTACEA</b>	
Amphipod	5
Isopods	8
Cumacea	123
Crustacean eggs	1456
Crustacean	2
Mysids	10
Egg mass	236
Brachyuran crabs	1689
<b>MOLLUSCA</b>	
Bivalves	369
Gastropods	263
<b>SCAPHOPODA</b>	
Dentalium	178
<b>FORAMINIFERA</b>	
Foraminifera	285
<b>CNIDARIA</b>	
Medusa	0
<b>ANNELIDA</b>	
Nereidae	225
Polychaetes	212
Spionidae	1456
<b>HYDROZOA</b>	
Hydrozoans	321
<b>Total biomass (g/m<sup>2</sup>)</b>	170.5

Authorized Signatory  
(Dr K Ganesan - Laboratory and Quality Manager)



1. The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization 2. Samples are not drawn by HECS unless or otherwise mentioned 3. Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report. 4. Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report. 5. The test results relate only to the test items.

HECS/Q/FMT/50

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**Laboratory Services Division**

(Chemical &amp; Biological Testing)

Recognized by MoEF, BIS

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**TEST REPORT**

Page 6 of 6

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Karnataka, India.
Sample Description	Biological Parameters - Phytoplankton's, Zooplanktons & Benthic Communities of Berth No. 14
Sampling date & Receipt	24.09.2021
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	16.10.2021
Report No	HECS/BC/001/240921

**RESULTS****Benthos community structure variability in the Berth No. 14**

Benthos	S	N	d	J'	H' (log 2)
Berth No. 14	16	6838	3.93	0.90	4.36

S	Total number of species (S)
N	Total number of individuals
d	Margalef's index
J'	Pielou's evenness index (J')
H'(log 2)	Shannon-Wiener diversity index

Diversity	Shannon-Wiener	bits/individual
High		>4
Good		3-4
Moderate		3-2
Poor		2-1
Bad		1-0

Dr K Ganeshan - Laboratory and Quality Manager  
Authorized Signatory  
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**TEST REPORT**

Page No. 1 of 1

Name of the Customer	M/s. JSW-Mangalore Container Terminal Pvt. Ltd.,
Address of the Customer	Berth No. 14, New Mangalore Port Trust, Panambur, Mangalore- 575 010, Dakshina Kannada Dist., Karnataka, India.
Sample Description	<b>DISCHARGE OF TREATED SURFACE RUNOFF</b>
Sample Mark	<b>Jetty - Berth No. 14</b>
Sample Drawn by	M/s. Hubert Enviro Care Systems (P) Ltd.,
Date of Sampling	24.09.2021
Qty. of sample received	2 L in HDPE Can and 1 L in Amber bottle
Date of Sample Receipt	24.09.2021
Analysis Commenced On	24.09.2021
Completed On	01.10.2021
Report No	HECSM/WW/002/240921
Report Date	04.10.2021

**RESULTS**

S.No.	Parameters monitored	Test method followed	Units	Results	KSPCB Std.
1.	pH at 25°C	IS 3025 (Part-11) 1983	-	7.56	6.5-9.0
2.	Total Suspended Solids (TSS)	2540 D APHA 23 <sup>rd</sup> Edn., 2017	mg/L	5.9	≤ 20
3.	Oil and Grease	IS 3025 (Pt 39): 2000 (RA 2014)	mg/L	BDL (DL 2)	≤ 10
4.	BOD, 3 days at 27°C as O <sub>2</sub>	IS:3025 (Pt 44)1993(RA 2009)	mg/L	4.8	≤ 10
5.	Chemical Oxygen Demand	IS 3025 (Pt 58): 2006 (RA 2017)	mg/L	20.1	≤ 50
6.	Phenolic content as C <sub>6</sub> H <sub>6</sub> OH	IS 3025 (Pt 43): 1992 (RA 2013)	mg/L	BDL (DL 0.001)	≤ 1.0

Note: mg/L - Milligrams per Liter

INFERENCE	As per KSPCB standards, The analysed parameters are within the prescribed limit.
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\*\*\*End of Report\*\*\*

Authorized Signatory  
(Dr K Ganesan - Laboratory and Quality Manager)