DEENDAYAL PORT AUTHORITY
(Erstwhile: DEENDAYAL PORT TRUST)

Tel(O) : (02836) 220038,
Fax : (02836) 220050
E Mail : kptdesignsection@gmail.com
kptemc@gmail.com
Website : www.deendayalport.gov.in

Administrative Office Building
Post Box NO. 50
GANDHIDHAM (Kutch).
Gujarat: 370 201.
Fax: (02836) 220050
Ph.: (02836) 220038

EG/WK/4751/Part (Ro-Pax)/

Dated: 18/03/2024

To,
The Director (Environment) & Member Secretary,
Gujarat Coastal Zone Management Authority,
Forest & Environment Department,
Govt. of Gujarat,
Block No.14, 8th floor,
Sachivalaya,
Gandhinagar – 382 010.

Sub: Bifurcation (600 mt waterfront out of total 4800 mt) of Environmental and CRZ clearance issued to M/s Essar Bulk Terminal Limited for Expansion of Port Facility at Hazira, Surat, Gujarat – **Submission of Compliance Report of Stipulated Conditions in CRZ recommendation reg.**

Ref.:
1. Bifurcation (600 mt water front out of total 4800 mt) of Environmental and CRZ Clearance issued to M/s Essar Bulk Terminal Limited for expansion of port facility at Hazira, Surat, Gujarat by the MoEF&CC, GoI vide letter F.No. 11-46/2011 - IA III dated 4/4/2022
2. Environmental and CRZ Clearance for the expansion of port facility at Hazira, Surat, Gujarat by M/s Essar Bulk Terminal Ltd by the MoEF&CC, GoI vide letter F.No. 11-46/2011 - IA III dated 06/05/2014
3. CRZ Recommendation issued by GCZMA, GoG vide letter dated 01/06/2013 to M/s Essar Bulk Terminal
4. DPA letter no. EG/WK/4751/Part (Ro-Pax)/346 dated 07/08/2023

Sir,

It is requested to kindly refer above cited reference for the said subject.

In this regard, it is to state that, the MoEF&CC, GoI, New Delhi vide above mentioned letter dated 4/4/2022 cited at Reference 1 had issued Bifurcation of Environmental and CRZ Clearance accorded to M/s Essar Bulk Terminal Limited vide letter of even number dated 6th May, 2014 in the name of Deendayal Port Trust (Now Deendayal Port Authority) for ***"Development of 600 m Waterfront and 24 ha. Back up Area at Hazira, Surat by Deendayal Port Trust (Now: Deendayal Port Authority)".***

In the said letter dated 4/4/2022, the MoEF&CC, GoI under Para 8 has mentioned that, Deendayal Port Authority shall comply with all the specific & general conditions stipulated in the EC & CRZ Clearance of even no. dated 6th May, 2014 cited at Reference 2.

.....Cont.....

Accordingly, as directed under Specific Condition no. (xv) stipulated in the EC & CRZ Clearance dated 6th May, 2014 i.e. All the conditions/ recommendations stipulated by Gujarat Coastal Zone Management Authority (GCZMA) No. ENV 10-2011-877-E dated 01.06.2013 shall be complied with, kindly find enclosed herewith compliance report of stipulated conditions in the CRZ recommendation for the period upto November, 2023 **(Annexure I)** along with necessary annexures, for kind information and record please.

Further, as per the MoEF&CC, Notification S.O.5845 (E) dated 26.11.2018, which stated that "In the said notification, in paragraph 10, in sub-paragraph (ii), ***for the words "hard and soft copies" the words "soft copy" shall be substituted"***. Accordingly, we are submitting herewith soft copy of the same via e-mail ID gczma.crz@gmail.com & direnv@gujarat.gov.in

This has the approval of Chief Engineer, Deendayal Port Authority.

Yours faithfully,

Encl.: As above

for SE (PL) & EMC (I/c)
Deendayal Port Authority

Copy to:

Shri Amardeep Raju,
Scientist E, Ministry of Environment, Forest and Climate Change,
& Member Secretary (EAC-Infra.1),
Indira Paryavaran Bhawan,
3rd Floor, Vayu Wing, Jor Bagh Road, Aliganj,
New Delhi- 110 003;
E-mail: ad.raju@nic.in

Annexure -I

Annexure I

Compliance report (upto November, 2023)

Project: Development of Ro-Ro/Ro-Pax Facility at Hazira by Deendayal Port Authority (600 m water front – 170 m berthing jetty and other allied structure viz. approach jetty, pontoons, link span etc. and 5 Ha. area (onshore facility).

Status of Project: Under Operation Stage (RoRo/RoPax facility: 170 m berthing jetty and other allied structure viz. approach jetty, pontoons, link span etc. and 5 Ha. area (onshore facility)). As per bifurcated EC & CRZ Clearance dated 4/4/2022 issued by the MoEF&CC, GoI, DPA has obtained Fresh CCA (PCB Id: 88242) from GPCB vide Order dated 10/07/2023 with validity upto 26/07/2027.

Reference:

- MoEF&CC, GoI, vide letter dated 4/4/2022 issued Bifurcation of EC&CRZ Clearance accorded to M/s Essar Bulk Terminal Limited vide letter dated 6th May, 2014 by MoEF&CC, GoI in the name of Deendayal Port Trust (Now Deendayal Port Authority).
- Condition no. (xv) under Specific Conditions "*All the conditions/recommendations stipulated by Gujarat Coastal Zone Management Authority (GZCMA) No. ENV 10-2011-877-E dated 01/06/2013*" of Environmental and CRZ Clearance accorded to M/s Essar Bulk Terminal Limited vide letter dated 6th May, 2014 by MoEF&CC, GoI.

Status of compliance of conditions stipulated in the CRZ Recommendation dated 01/06/2013:

Sl. No.	EC Condition	Compliance
1.	The provisions of the CRZ Notification of 2011 shall be strictly adhered to by M/s EBTL. No activity in contradiction to the provisions of the CRZ Notification shall be carried out by M/s EBTL.	With regard to Ro-Ro/Ro-Pax Facility developed by DPA, the provisions of the CRZ Notification of 2011 are being strictly adhered to by DPA and no activity in contradiction to the provisions of the CRZ Notification has been carried out.
2.	Natural drainage system shall be designed in such a way that there shall be no damage to the existing mangrove patches nearby site.	The GMB had allotted land of 24 Hectares to Deendayal Port Authority devoid of Mangroves. However, due care is being taken so that Natural Drainage System will be maintained.
3.	The Essar Bulk Terminal Limited shall take up mangrove plantation in 500 ha of land in consultation with GEC/Forest department.	The GMB had allotted land of 24 Hectares to Deendayal Port Authority devoid of Mangroves.

		However, due care is being taken so that Natural Drainage System will be maintained. As per the directions of the MoEF&CC, GoI/ GCZMA, till date, DPA had undertaken Mangrove Plantation in an area of 1500 Hectares at various locations (Copy of the statement has already been communicated with the compliance report dated 05/08/2022). Further, DPA has carried out additional mangrove plantation of 100 ha. with consultation of Gujarat Ecology Commission vide Work Order No. DD/WK/3050/Pt-I/GIM/PC-44 dated 02/06/2022 (Copy of the work order has already been communicated with the compliance report dated 05/08/2022). For regular monitoring of mangroves, DPA engaged M/s GUIDE, Bhuj during the year 2017 & subsequently, vide work order dated 3/5/2021. The final report submitted by M/s GUIDE has already been communicated with the compliance report dated 05/08/2022.
4.	Coal, ore and other material handling shall be done through totally closed system.	N/A. DPA developed Ro-Ro/Ro-Pax facility which is being used for public conveyance and also for trailer, trucks, cars etc.

5.	All necessary permissions from different Government Departments/ agencies, including GMB, shall be obtained by M/s EBTL, before commencing the activities.	The Ministry of Ports, Shipping & Waterways, Government of India appointed Deendayal Port Authority (Erstwhile: DPT) as its nominee to take over the Project assets under the Concession Agreement (at Ghogha and Dahej terminals and the maintenance dredging at Dahej terminal) and also the assets at Hazira for the Ro-Pax ferry service. **For the purpose, the 600m waterfront along with 24 ha backup land is allotted to Deendayal Port Authority by the Gujarat Maritime Board, GoG at Hazira for developing Ro-Ro/Ro-Pax Facility at Hazira (Copy of GMB – Annexure 1).** As directed in the Bifurcated EC & CRZ Clearance issued to DPA by the MoEF&CC, GoI dated 4/4/2022 **(Copy once again attached - Annexure 2)**, DPA also obtained Consent to Establish (CTE-55353) (after obtaining Environmental Clearance), vide dated 24/6/2022 (**Copy once again attached – Annexure 3)** from the Gujarat Pollution Control Board (under Water Act 1974 and Air Act 1981) in the name of DPA for development of 600 m waterfront and 24 ha back up area. Further, DPA has obtained fresh CCA (PCB Id: 88242) from GPCB vide Order dated 10/07/2023 with validity upto 26/07/2027.
6.	All the recommendations and suggestions given by WAPCOS in their Environmental Impact Assessment reports for conservation/ protection and betterment of environment shall be implemented strictly by M/s EBTL.	Point noted.
7.	The construction and operational activities shall be carried out in such a way that there is no negative impact on mangroves, if any, and other important coastal / marine habitats.	The GMB had allotted land of 24 Hectares to Deendayal Port Authority devoid of Mangroves. However, due care is being taken so that there is no negative impact on mangroves,

	Construction activity shall be carried out only under the guidance/ supervision of the reputed institute / organization.	if any, and other important coastal/ marine habitat. The Ro-Ro/Ro-pax facility is under operation.
8.	M/s EBTL shall strictly ensure that no rivers are blocked due to any activity at the proposed site.	It is assured that; due care is being taken by DPA so that no rivers are blocked due to any activity at the project site.
9.	The construction debris and / or any other type of waste shall not be disposed of in to the sea, creek or in the CRZ area. The debris shall be removed from the construction site immediately after construction is over.	Currently, The Ro-Ro/Ro-pax facility is under operation.
10.	The construction camps shall be located outside the CRZ area and the construction labour shall be provided with the necessary amenities, including sanitation, water supply and fuel and it shall be ensured that the environmental conditions are not deteriorated by the construction labours.	Currently, the Ro-Ro/Ro-pax facility is under operation.
11.	M/s EBTL shall bear the cost of the external agency that may be appointed by this department for supervision / monitoring of proposed activities and the environmental impacts of the proposed activities.	Currently, the Ro-Ro/Ro-pax facility is under operation.
12.	The groundwater shall not be tapped within the CRZ areas by the EBTL to meet with the water requirements in any case.	Water requirements are met through private tankers.
13.	M/s EBTL shall take up massive greenbelt developmental activities in consultation with Forest Department / GEER Foundation / Gujarat Ecology Commission. A comprehensive plan for this purpose has to be submitted to the Forest and Environment Department.	DPA had already developed required planation (area of about 7000 m^2) within the Ro-Ro/Ro-Pax Terminal area.

14.	The EBTL shall have to take up bio-shielding development programme as part of CSR in consultation with Forest Department / PCCF and an action plan in this regard shall have to be submitted to the MoEF, GoI and this department.	Not Applicable. DPA developed Ro-Ro/Ro-Pax facility which is being used for public conveyance and also for trailer, trucks, cars etc.
15.	The EBTL shall have to contribute financially for taking up the socio-economic upliftment activities in this region in consultation with the Forest and Environment Department and the District Collector / District Development Officer.	As per the CSR Guidelines issued from time to time by the MoPSW, GoI, DPA since the year 2011-12 had carried out various CSR activities **(Annexure 4)**
16.	A separate budget shall be earmarked for environmental management and socio-economic activities including the greenbelt/ mangrove plantation and details thereof shall be furnished to this Department as well as the MoEF, GoI. The details with respect to the expenditure from this budget head shall also be furnished along with the compliance report.	The allocation made under the scheme of "Environmental Services & Clearance thereof other related Expenditure" during BE 2023-2024 is Rs. 274 Lakhs. The expenditure made under the scheme of "Environmental Services & Clearance thereof other related Expenditure" is Rs. Approx. 272 Lakhs from June, 2023 to November 2023.
17.	A separate Environmental Management Cell with qualified personnel shall be created for environmental monitoring and management during construction and operational phases of the project.	DPA is already having dedicated EMC. In this regard, DPA has also appointed expert agency for providing Environmental Experts from time to time. Currently, DPA appointed M/s Precitech Laboratories Pvt. Ltd., Vapi for three years vide work order dated 5/2/2021 (Copy of Work Order has already been communicated with the compliance report dated 05/08/2022). In addition, DPA has also appointed Manager (Environment) on contractual basis for a period of 3 years & further extendable for 2 years (Copy of the offer of appointment has already been communicated with the compliance report dated 05/08/2022). Further, DPA had assigned the work of monthly environmental monitoring to M/s A 2 Z Envirotech vide Work Order dated

		15/09/2022. The copy of the monitoring reports is attached herewith as **Annexure 5.** Recently, DPA has assigned the work of monthly environmental monitoring to GEMI, Gandhinagar for a period of 3 years vide letter dated 18/04/2023. The work is in progress, and the latest environmental monitoring report submitted by GEMI, Gandhinagar, is attached herewith as (**Annexure 6**).
18.	Environmental Audit report indicating the changes, if any, with respect to the baseline environmental quality in the coastal and marine environment shall be submitted every year by M/s EBTL to this department as well as to the MoEF, GoI.	Point noted for compliance. In this regard, it is relevant to mention here that, DPA had assigned the work of monthly environmental monitoring to M/s A 2 Z Envirotech vide Work Order dated 15/09/2022. The copy of the monitoring reports is attached herewith as **Annexure 5.** Further, DPA has assigned the work of monthly environmental monitoring to GEMI, Gandhinagar for a period of 3 years vide letter dated 18/04/2023. The work is in progress, and the latest environmental monitoring report submitted by GEMI, Gandhinagar, is attached herewith as (**Annexure 6**).
19.	A six monthly report on compliance of the conditions mentioned in this letter shall have to be furnished by M/s EBTL on a regular basis to this Department as well as to the Ministry of Environment and Forest, Government of India.	It is assured that w.r.t. subject project, six monthly report on compliance of the conditions mentioned in this letter will be furnished by DPA on a regular basis to GCZMA as well as to the Regional Office, MoEF&CC, GoI.
20.	Any other condition that may be stipulated by this Department / Ministry of Environment and Forest, Government of India from time to time for Environmental Protection / management purpose shall also have to be complied with by M/s EBTL.	Point noted.

Annexure -1

Annexure - III

GUJARAT MARITIME BOARD
(GOVERNMENT OF GUJARAT)
SAGAR BHAVAN | Sector 10/A | Cvh Road | Opp. Air Force Station
Gandhinagar 382010 | Gujarat (INDIA)
Phone +91 79 23238346 47 48 51 | Fax +91 79 23234704
E-mail: info@gmbports.in

No: GMB/PID/296 (subfile)/ 2109

Date: 01/07/2020

To:
The Chief Engineer
Deendayal Port Trust
Kandla

Subject: Allotment of 600m waterfront and 24 hectare land at Hazira to DPT for Development of Ro-Pax Ferry Terminal

Reference: i) GMB letter No. GMB/PID/296(2) Dated 30/5/2020
ii) Your letter No. CN/WK/1600 Dated 9/6/2020

Sir,

In reference to the Video Conference chaired by Hon. Minister, Ministry of Shipping, Government of India on 29th May 2020, GMB vide above referred letter granted in-principle approval of the Government of Gujarat (GoG) for allotment of necessary land alongwith waterfront for proposed Ro-Pax Jetty and approach road at Hazira to Deendayal Port Trust (DPT). Vide our letter dated 30/05/2020, DPT was allowed to carry out the required technical feasibility and other preparatory work for early implementation of the project, in anticipation of the necessary approval of the state government for formal allotment of land of approx. 15 hectare, as per existing government GRs and Circulars.

In view of your letter in reference, the Board of GMB has resolved to recommend the proposal to Government of Gujarat for the allotment of 600m waterfront and 24 hectares of land at Hazira to DPT on lease basis. However, in view of the urgency and priority of the project, subject to the approval of the GoG, I am directed to handover the advance possession of the said land and waterfront so as to enable you to start the work at site.

Yours faithfully,

Chief Engineer

Annexure -2

F. No. 11-46/2011-IA.III
Government of India
Ministry of Environment, Forest and Climate Change
(IA-III Section)

Indira Paryavaran Bhawan
Jor Bagh Road, Aliganj,
New Delhi – 110003
E-mail: ad.raju@nic.in
Tel: 011-24695296

Dated: 4th April, 2022

To
Sh. Suresh Patil
Chief Engineer
M/s DEENDAYAL PORT TRUST
A. O. Building, P.O.Box no. 50, Gandhidham- Kutch
Gujarat- 370 201.

Subject: Bifurcation (600 mt waterfront out of total 4800 mt) of Environmental and CRZ Clearance issued to M/s ESSAR Bulk Terminal Limited for expansion of Port facility at Hazira, Surat, Gujarat- Transfer of Environmental and CRZ Clearance - Reg.

Sir,

This has reference to your letter No. 'EG/WK/4751 (Part RO-Pax), dated 14th August, 2021 regarding the transfer of Environmental and CRZ Clearance from M/s ESSAR Bulk Terminal Limited (EBTL) to M/s Deendayal Port Trust (DPT) for the project mentioned above.

2.0 It has been noted that the project mentioned above was accorded environmental and CRZ clearance by the Ministry *vide* letter of even number dated 06th May, 2014 to the ESSAR Bulk Terminal Limited for the "Expansion of Port facility" at Hazira, Surat, Gujarat. Ministry has examined your application regarding transfer of EC and CRZ clearance and noted that Gujarat Maritime Board (GMB), Govt. of Gujarat has allotted the above said water front along with backup land to DPT for development of 600 m waterfront and 24 ha backup area at Hazira port for RoRO/RoPax facility.

3.0 The Principal Secretary, Ports & Transport Department, Government of Gujarat, vide a letter No. GMB-ENV-3(41-E)/3639 dated 20(21)/07/2020 addressed to the Secretary, MoEF&CC, GoI, has stated that the entire water front for 4800 m has been accorded EC/CRZ Clearance to M/s EBTL, Surat, out of which 600 m waterfront with 24 Ha Land adjoining to existing developed waterfront is now proposed to be developed by Deendayal Port Trust (DPT) under the direction of the Ministry of Shipping.

4.0 No Objection Certificate/Affidavit dated 15.06.2021 from transferee i.e., M/s Deendayal Port Trust (DPT) in a non-judicial stamp paper for bifurcation and transfer of environmental and CRZ clearance letter dated 06th May, 2014 has been received. In addition, the undertaking mentioning that M/s Deendayal Port Trust shall comply with all the conditions mentioned in the Environment Clearance has been received.

5.0 No Objection Certificate/Affidavit dated 14.02.2022 from transferor i.e., M/s ESSAR Bulk Terminal Limited (EBTL) in a non-judicial stamp paper has been received for Bi-furcation and transfer of its environmental and CRZ clearance letter dated 06th May, 2014 for the "Development of 600 m water front & 24 Ha back up area by M/s DPT".

6.0 In view of the above, it has been decided by the Ministry to accord Bi-furcation in the Environment and CRZ Clearance accorded to M/s ESSAR Bulk Terminal Limited (EBTL) *vide* letter of even number dated 06th May, 2014 in the name of M/s Deendayal Port Trust for "Development of 600 m water front & 24 Ha back up area by M/s Deendayal Port Trust".

7.0 You are requested to obtain 'Consent to Establish' and 'Consent to Operate' from the State Pollution Control Board concerned in the name of M/s Deendayal Port Trust.

8.0 M/s Deendayal Port Trust shall comply with all the specific and general conditions stipulated in the environmental and CRZ clearance of even no. dated 06th May, 2014. All other conditions stipulated in the environmental and CRZ clearance letter shall remain the same.

9.0 In case, there is a change in the scope of the project, fresh environmental and CRZ clearance shall be obtained.

This issues with the approval of the Competent Authority.

(Amardeep Raju)
Scientist-E

Copy to:

1. The Principal Secretary, Department of Forests & Environment and Chairman, GCZMA, Govt. of Gujarat, Sachivalaya, Gandhinagar.
2. The Regional Officer, Ministry of Env., Forest and Climate Change, Integrated Regional Office, Gandhi Nagar, A wing- 407 & 409, Aranya Bhawan, Near CH-3 Circle, Sector-10 A, Gandhi Nagar-382010.
3. The Chairman, Central Pollution Control Board Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, New Delhi - 110 032.
4. The Member Secretary, Gujarat Pollution Control Board, Sector 10-A, Gandhi Nagar - 382043.
5. The Chief executive Officer, M/s ESSAR Bulk Terminal Limited (EBTL), 27 km, Surat-Hazira Road, Hazira – 394 270, Gujarat.
6. Monitoring Cell, MoEF&CC, Indira ParyavaranBhavan, New Delhi.
7. Guard File/ Record File/ Notice Board.

(Amardeep Raju)
Scientist-E

Annexure -3

GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN
Sector-10-A, **Gandhinagar** 382010
Phone : (079) 23222425
(079) 23222152
Fax : (079) 23232156
Website : www.gpcb.gov.in

GPCB

Application For CTE after EC

File No : GPCB/ **(PCB ID. - 88242)**

CTE-55353

To,
M/s. Deendayal Port Authority,
, Essar Bulk Terminal Ltd, Adani Hazira Port Rd, Hazira Gam, Suvali, Hazira, Gujarat 394270,
City :Hazira ,
Dist : Surat ,
Taluka : Chorasi

Sub: Consent to Establish (After obtaining Environment Clearance) under Section 25 of Water Act 1974 and Section 21 of Air Act 1981.

Ref: (1) Your online application No. 257450 dated 12/05/2022

(1) Environment Clearance issued by Central Authority vide their letter no. F.No.11-46/2011-IA.III Dated 04/04/2022

Sir,

Without prejudice to the powers of this Board under the Water (Prevention and Control of Pollution) Act-1974, the Air Act-1981 and the Environment (Protection) Act-1986 and without reducing your responsibilities under the said Acts in any way, this is to inform you that this Board grants **Consent to Establish (After obtaining Environment Clearance) under Section 25 of Water Act 1974 and Section 21 of Air Act 1981** for manufacturing of products as mentioned into the Environment Clearance (EC) granted vide letter under reference no (2) above.

Consent To Establish Is Granted Subject To The Following Conditions: -

1) The validity period of this CTE shall be Seven Years from the issue of this order.
2) Applicant shall strictly comply with all conditions stipulated by competent authority in the order of Environment Clearance issued vide letter under reference No. : 2 above.
3) The applicant shall however , not without the prior concern of the Board. Bring into use any new or altered outlet for the discharge of effluent or gaseous emission or sewage waste from the proposed industrial plant. The applicant is required to make applications to this Board for this purpose in the prescribed forms under the provisions of the water Act - 1974, the Air - 1981 and the Environment (Protection) Act - 1986.

For and on behalf of
Gujarat Pollution Control Board

J.D.OZA
ROH Head - Surat

- This order is issued to , **Essar Bulk Terminal Ltd, Adani Hazira Port Rd, Hazira Gam, Suvali, Hazira, Gujarat 394270, City :Hazira, Dist : Surat, Taluka : Chorasi (88242)** for CTE amendment after obtaining EC.

Annexure -4

YEAR WISE ACTUAL WORK COSTING OF CSR WORKS APPROVED BY BOARD

1) CSR Works executed during the year 2011 – 2012 and year 2012 – 2014. (Upto Dec'21)

Sr. no	Name of work	Actual cost (Rs in Lakhs)
1.	(a).Road from Dr. Baba Saheb Ambedkar Circle to N.H. 8-A (Via Ganesh Nagar).	Rs.482.65 Lakhs
	(b)Road from S.T. Bus Stand (N.H. 8 – A) to Sunderpuri Cross Road Via Collector Road.	
	(C)Road from N.H. 8 –A Railway Crossing to Maninagar (Along Rly Track).	
	(d)Road from Khanna Market Road (Collector Road) to Green Palace Hotel.	
2.	Construction of Internal Roads at "Shri Ram" Harijan Co-op. Housing Society Ltd. (Nr. Kidana).	
3.	(a)Construction of Cremation Ground and kabrastan with other facilities at Vadinar.	Rs 19.44 (Lakhs)
4.	(b)Providing Cement Concrete internal roads in village Vadinar Stage –I.	Rs 16.16 (Lakhs)
	(a)Approach Road provided for developing the Tourism at village Veera near Harsidhi Mata Temple where lot of tourists & Pilgrims visit.	Rs. 4.65 (Lakhs)
	(b)Water Tank along with R.O. provided near by developing Tourism area.	Rs. 30,000 (Thousand)
	(c)Creating facility of flooring and steps surrounding the lake to stop the soil erosion and attract the tourists, at Village Veera.	Rs. 4.80 (Lakhs)
	Total Rs	**528 Lakhs**

2)CSR Works for the year 2014-2015.

Sr. no	Name of work	Actual cost (Rs in Lakhs)
1.	Construction of Community Hall-cum school at Maheshwari Nagar, G'dham	Rs 51.90 Lacs
2.	Renovation of "Muktidham" at Kandla	Rs 10.65 Lacs
3.	Sunderpuri-1 valmiki community hall	Rs 5.00 Lacs
	Sunderpuri-2 valmiki community hall	Rs 5.00 Lacs
	Ganeshnagar Community Hall	Rs 10.00 Lacs
	JagjivanMaheshwari community hall	Rs 10.00 Lacs
	Various works of Road of Sapanagar	Rs 99.19 Lac
4.	Construction of compound wall in the Dam of Jogninar village	Rs 14.48 lacs
5.	In addition above 30 Lakhs as committed in Public Hearing meeting held on 18/12/2013 an amount Rs 30 Lakhs shall also be contributed for the CSR works to be carry out at villages Tuna, Vandi , Rampar, Veera etc.	Rs 30.00 Lacs
	Total Rs.	**Rs 236.22 Lacs**

3)CSR Works for the year 2015-2016.

Sr. no	**Name of work**	**Actual cost (Rs in Lakhs)**
1.	Construction of toilets for Girls / Ladies at Khari Rohar village	**Rs. 3.00 Lakhs**
2.	Construction of Toilets for Girls manatMathak Primary School, Mathak Village	**Rs. 3.00 Lakhs**
	Total	**Rs.6.00 Lakhs**

4)CSR Works for the year 2016-2017.

Sr. no	**Name of work**	**Actual cost (Rs in Lakhs)**
1.	RCC Community Hall at Harshidhi Mata Temple, Veera village, AnjarTaluka	Rs.19.00 Lakhs
2.	Fabricated Community Hall at Sanghad village, AnjarTaluka	Rs.21.00 Lakhs
3.	CSR Works for Shri MaheshwariMeghvadSamaj, Gandhidham at Grave Yard , Behind Redison Hotel.	Rs.8.00 Lakhs
4.	CSR works for ShirDhanrajMatiyadevMuktiDham, Sector-14 , Rotary Nagar, Gandhidham	Rs. 30.50 Lakhs
5.	CSR works for NirvasitHarijan Co-operative Housing Society, Gandhidham.(Health Cum Education Centre)	Rs. 41.00 Lakhs
6.	CSR works for Shri Rotary Nagar Primary school, Gandhidham.	Rs. 2.80 Lakhs
7.	CSR works at NU -4 , NU-10(B) Sapnanagar& Saktinagar, Golden Jublee Park, at Gandhidham	Rs. 18.00 Lakhs
	Total	**Rs 140.30 Lakhs**

5)CSR Works for the year 2017-2018.

Sr. no	**Name of work**	**Actual cost (Rs in Lakhs)**
1.	CSR works at Shri Ganesh Nagar Govt High School, Gandhidham	38.30
2.	Grant Financial contribution for facility of Army cantonment for 50 air coolers at Kutch Border Area.	15.00
3.	CSR works at Tuna & Vandi villages (providing drainage lines under Swachh Bharat Abhiyan)	39.80
4.	CSR works for S.H.N Academy English School (Managed by Indian Institute of Sindhology –Bharati Sindhu Vidyapeeth), Adipur	40.00
5.	Construction of Internal Road at Bhaktinagar Society, Kidana	
	Total	**148.10**

6) CSR Works for the year 2018-19

Sr. no	Name of work	Actual cost (Rs in Lakhs)
1.	CSR work to Donate 100 Nos of Computers to Daughters of Martyred Soldiers in the country under the "BETI BACHAO BETI PADHAO" program by Atharva Foundation, Mumbai	Rs 24.00 Lakhs
2.	CSR work to Donate ONE (40 Seater) School Bus for Deaf Children Students for the Institute of Mata Lachmi Rotary Society, Adipur	Rs 18.00 Lakhs
3.	CSR work to Providing One R.O Plant with Cooler at Panchyat Prathmik Sala, Galpadar Village for the ANARDE Foundation, Kandla & Gandhidham Center.	Rs 1.50 Lakhs
4.	CSR work for Providing Drainage Line at Meghpar Borichi village, Anjar Taluka	Rs 25.00 Lakhs
5.	CSR work for Construction of Health Centre at Kidana Village	Rs 13.00 Lakhs
6.	CSR work to provide 4 Nos. of Big Dust Bin for Mithi Rohar Juth Gram Panchayat	Rs 3.40 Lakhs
7.	CSR work for Renovation & construction of shed at Charan Samaj, Gandhidham –Adipur.	Rs 10.00 Lakhs
8.	CSR Work for Renovation/Repairing of Ceiling of School Building at A. P Vidhyalay, Kandla	Rs 10.00 Lakhs
9.	CSR work for Construction of Over Head Tank & Providing 10 Nos of Computers (for students) of Navjivan Viklang Sevashray, Bhachau, Kutch	Rs 9.50 Lakhs
10.	CSR work to Provide Books & Tuition fees for Educational facilities to weaker section children of ValmikiSamaj, Kutch	Rs 2.00 lakhs
11.	CSR work to provide Water Purifier & Cooler for the ST. Joseph's Hospital, Gandhidham	Rs 1.50 Lakhs
12.	CSR work for Construction of Second Floor (Phase – I) for Training Centre of "GarbhSanskran Kendra" "Samarth Bharat Abhiyan" of Kutch KalyanSangh, Gandhidham	Rs 37.00 Lakhs
	Total cost	**Rs 154.90 Lakhs**

7) CSR Works for the year 2019-20

Sr. no	Name of work	Actual cost (Rs in Lakhs)
1.	CSR activities for Providing Drainage line at Nani Nagalpar village.	3.00
2.	CSR activities for Development of ANGANWADI Building at School no- 12 at Ward no 3 & 6 at Anjar.	7.00
3.	CSR activities for Improving the facilities of Garden at Sapna Nagar(NU-4) & (NU-10 B),Gandhidham.	18.00
4.	CSR activities for development of School premises of Shri Guru Nanak Edu. Society, Gim.	30.00
5.	CSR activities for the improvement of the facilities at St JOSEPH Hospital &Shantisadan at Gandhidham	20.00
6.	Consideration of Expenditure for running of St Ann's High School at Vadinar of last five years 2014 to 2019 under CSR.	825.00
7.	CSR activities for development of school premises of Shri Adipur Group Kanya Sala no-1 at Adipur	6.50
8.	CSR activities for development of school premises of ShriJagjivan Nagar PanchyatPrathmiksala, Gandhidham	16.50
9.	CSR activities for development of school premises of Ganeshnagar Government high school, Gandhidham	9.00
10.	CSR activities for improving greenery, increase carbon sequestration and beat Pollution at Kandla, DPA reg.	352.32
11.	CSR activities for providing infrastructures facilities at "Bhiratna Sarmas Kanya Chhatralaya" under the Trust of SamajNav- Nirman at Mirjapur highway, Ta Bhuj.	46.50
	Total cost	**1333.82**

8) CSR Works for the year 2020-21

Sr. no	Name of work	Actual cost (Rs in Lakhs)
1.	CSR Proposal for earmarking of 15% Funds for National Marintime Heritage Complex, Lothal, Gujarat (NMHC) from allocated CSR Fund of Rs 3.46 Cr	51.90
	Total	**51.90**

9) CSR Works for the year 2021-22

Sr. no	Name of work	Actual cost (Rs in Lakhs)
1.	CSR Activities for providing Water supply pipe line for drinking water facilities for poor people & Fishermen at VANDI Village.	20
2.	CSR activities for providing facilities in Girls Hostel of Kasturba Gandhi Balika Vidhyalay, Gandhidham. Cost for Construction of compound wall, entrance gate, girls toilets)	30
3.	CSR works for Construction of Auditorium Hall at RSETI (Rural Self Employment Training Institute) at Bhujodi-Bhuj.	16
4.	CSR works for the providing of SOLAR POWER SYSTEM and other facilities for 0the JEEV SEVA SAMITI at Gandhidham.	9.3
5.	CSR Activities for providing HD projector for KANYA MAHA VIDYALAYA, Adipur	1.5
6.	CSR works for Construction of New Building for Setting up of skill development centre at Rajkot (Sewa Gujarat).	250
7.	CSR Works for Ladies Environment Action Foundation (LEAF) Trust for providing infrastructure to the primary school at Gandhinagar District	46.5
8.	CSR works lor Providing of Furniture for the School "Shri Galpadar Panchayat Prathmic Kumar group Sala" at Galpadar village,Taluka:Gim	5
	Total Cost	**378.3**

10) CSR Works for the year 2022-23

Sr. no	Name of work	Actual cost (Rs in Lakhs)
1.	CSR work for providing One Bore hole with construction one room along with Motor pump at Village MOTI NAGALPAR, Anjar.	18
2.	CSR work for Construction of Shamashan bhoomi (Crematorium) at Gandhidham.	49.5
3.	CSR work for providing metallic sheet DOME in Community Hall at Old Sunderpuri for Shri Juni Sundarpuri Maheshwari Samaj at Gandhidham.	15
4.	CSR Activities for construction of Samajwadi at village: Rampar,Taluka:Anjar.	15
5.	Financial assistance under CSR for providing basic facilities at Gandhidham GSRTC bus station.	25
6.	CSR Activities for construction of School Building for physically disabled, deaf & mute children, Shri & Shrimati Chhaganlal Shyamjibhai Virani Behera Munga Shala Trust, Virani Deaf School at Rajkot.	5
7.	CSR work for construction of new Administrative staff block for the Maitri Maha Vidhyalaya, Adipur.	64.65
8.	Financial support under CSR for providing 60 seater school bus for "Aadhaar Sankul", Manav Seva Trust,Gandhidham.	25
9.	CSR work for extension of Night shelter cum old age home for “DADA BHAGWANDAS ADVANI TRUST” Adipur.	78
10.	Financial assistance under CSR for Rooftop Solar System & Afforestation under clean energy & sustainable development in 10 villages around DPA	63.72
	Total Cost	**358.87**

11) CSR Works for the year 2023-24

Sr. no	Name of work	Actual cost (Rs in Lakhs)
1.	CSR works for Shree Kachchh Mahila Kalyan Kendra, Bhuj-Kutch	55
2.	CSR Activities for Installation of 125 no. Sanitary Pad Vending Machines at Women Hostels,NGOs etc, in Kutch District	15
3.	CSR Fund for Vadinar Village & surrounding	128.54
4.	CSR Activities for Girls Hostel at Kasturba Gandhi Balika Vidhyalaya At Shinay, Taluka:Gim.	33.25
5.	CSR request for Allotment of fund for construction of Community hall at Adipur for Maheshwari Meghval Samaj.	25
6.	CSR Request for requirement of funds for renovation work in Sector-7, Gandhidham (Aryasamaj Gandhidham)	30
7.	CSR Request for providing"Antim Yatra Bus" & Mortuary Cabinet Morgue" for Adipur-Gandhidham from CSR Funds,	25
8.	CSR Request for creation of a Children park at Gandhidham Military Station, Gandhidham	15
9.	CSR Request for construction of Toilet block units for Girls & Boys NAV JIVAN VIKLANG SEVA SHREY Bhachau	3.04
10.	CSR Request for laying Synthetic Athletic track in Galpadar and to Provide One E-Kart facility for Conveyance of youths at BSF Campus, Gandhidham	75
11.	CSR request for submitted by AAS, Indore for solid waste Management at Gandhidham & Kandla.	49.93
12.	CSR request from Trikamsaheb Manav Seva Trust at Madhapar Near Bhuj for grant for Construction of Community Hall, Compound Wall etc.	40
13.	CSR Request for construction of Dome shaped shed at Rampar Village Prathmik Shala,Rampar	24
14.	CSR Fund for development of School premises of Shri Guru Nanak Education	4.5
15.	CSR Request for conducting Awareness campaigns on T.B. Prevention & treatment, Mumbai	60
16.	CSR Request for fund under CSR for Railway Institute, Gandhidham, Western	5
17.	CSR Proposal project for Sanitary Pad Making Machine for School Girls, Anjar	12.39
	Total Cost	**600.65**

Annexure -5

ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 15/10/2022
Report No : A2ZELPL/AN/102022/01

Description of Sample:					
Date of Sampling	:	07/10/2022	**Type of Sampling**	:	NOISE
Date of Sample Received	:	07/10/2022	**Sample ID**	:	AN/102022/01
Sampling Location of Sampling Point	:	HAZIRA PORT DPT	**Sample Particular**	:	-----
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	IS 9989-1991
Instrument calibration status	:	OK	**Date of Analysis Start**	:	-----
Metrological conditions during monitoring	:	CLEAR SKY	**Date of Analysis Completion**	:	-----
Instrument code	:	A2ZELPL/SLM/01	**Actual Duration of Monitoring (MINUTE)**		30

Test Results

Sr. No.	LOCATION	L10 dB	L50 dB	L90 dB	CPCB LIMIT	UNIT	REFERENCE METHOD
1	Nr Turning jetty	73.4	42.5	31.2	75	dB	IS 9989-1991
2	Nr.Terminal	61.7	31.3	19.5	75	dB	IS 9989-1991
3	Nr. D.G set	72.2	40.6	29.7	75	dB	IS 9989-1991

A. A. Jalori
Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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---------- **End of Report** ----------

ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 15/10/2022
Report No : A2ZELPL/SW/10/2022/01

Description of Sample:					
Date of Sampling	:	07/10/2022	**Type of Sampling**	:	Surface Water
Date of Sample Received	:	09/10/2022	**Sample ID**	:	SW/102022/01
Sampling Location of Sampling Point	:	NEAR JETTY AREA HAZIRA DPT	**Sample Particular**	:	MARIN WATER
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	------
Sample Quantity /Total No.	:	2 Litre/1Nos.	**Date of Analysis Start**	:	09/10/2022
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	10/10/2022
Environment condition during the test	:	25 ± 3 °C			

Test Results

Sr. No.	Parameters	Results	Unit	Reference Method
1.	pH	7.26	-	APHA, 23rd Edition 2017/4500-H+ B
2.	Turbidity	73	NTU	--------
3.	Temperature	26.8	°C	APHA, 23rd Edition 2017/2550B

A. A. Jalori

Tested By
(Sr. Analyst/Analyst)

Authorized Signator
Akbarkhan P. Jalori
(Quality Manager)

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Plot No. 340, Sector 1A, 2nd Floor,
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Gandhidham - Kachchh. Gujarat - 370201

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ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-04
Date of Report : 15-10-2022
Report No : A2ZELPL/S/102022/01

Description of Sample:					
ate of Sampling	:	07-10-2022	**Type of Sampling**	:	Composite
Date of Sample Received	:	09-10-2022	**Sample ID**	:	S/102022/01
Sampling Location of Sampling Point	:	NEAR JETTY AREA HAZIRA DPT	**Sample Particular**	:	Soil
Sample Collected / Submitted by	:	A2ZELPL Member	**Reference Method for Sampling**	:	SOP
Sample Quantity /Total No.	:	1 Kg/1Nos.	**Date of Analysis Start**	:	09-10-2022
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	11-10-2022
Environment condition during the test	:	25 ± 3 °C			

Test Results

Sr. No.	Parameters	Unit	Results	Reference Method
1.	Available Phosphorus as P	mg/kg	148.4	IS 6361:1971/Reaffirmed 2020
2.	Organic matter	%	0.65	IS 2720 (Part 22) 1972/Reaffirmed 2015
3.	Total Soluble Sulphates	mg/kg	52.7	IS :2720 (Part 28)1976/ Reaffirmed 2015

A. A. Jalori
Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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End of Report

ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

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DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 15/10/2022
Report No : A2ZELPL/AA/102022/01

Description of Sample:					
Date of Sampling	:	07/10/2022	**Type of Sampling**	:	AIR
Date of Sample Received	:	09/10/2022	**Sample ID**	:	AA/102022/01
Sampling Location of Sampling Point	:	Near Driver Rest Room Hazira DPT	**Sample Particular**	:	AMBIENT AIR
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	-----
Sample Quantity /Total No.	:	1	**Date of Analysis Start**	:	09/10/2022
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	11/10/2022
Environment condition during the test	:	25 ± 3 °C	**Metrological conditions during monitoring**		Clear Sky
Instrument code	:	A2ZELPL/RDS/01 A2ZELPL/FDS/01	**Actual Duration of Monitoring (Hours)**		24

TEST RESULT (COMPARE WITH NAAQS)

Sr. No.	Parameters	Results	Unit	Reference Method
1.	Particulate Matter PM_{10}	41.9	µg/m3	IS 5182 (Part 23)2006/ Reaffirmed 2017
2.	Particulate Matter $PM_{2.5}$	22.7	µg/m3	IS 5182 (Part 24)2019
3.	Sulfur Dioxide SO_2	15.3	µg/m3	IS 5182 (Part 2)2001/ Reaffirmed 2017
4.	Nitrogen Dioxide NO_2	12.1	µg/m3	IS 5182 (Part 6)2006/ Reaffirmed 2017
5.	Wind Speed	21.1	km/h	-----
6.	Wind Direction	ENW-WSW	--	-----
7.	Tempreture	28	°C	-----

A. A. Jalori
Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

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SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 15/10/2022
Report No : A2ZELPL/DW/10/2022/0

Description of Sample:					
Date of Sampling	:	07/10/2022	**Type of Sampling**	:	Drinking Water
Date of Sample Received	:	09/10/2022	**Sample ID**	:	DW/102022/01
Sampling Location of Sampling Point	:	Admin Office Hazira port DPT	**Sample Particular**	:	Drinking Water
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	IS 3025 (Part-1)
Sample Quantity /Total No.	:	2 Litre/1Nos.	**Date of Analysis Start**	:	09/04/2022
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	11/04/2022
Environment condition during the test	:	25 ± 3 °C			

TEST RESULT (COMPARE WITH IS 10500:2012)

Sr. No.	Parameters	Results	Unit	Reference Method
1.	pH	8.16	-	APHA, 23rd Edition 2017/4500-H+ B
2.	Total organic carbon	0.7334	mg/L	
3.	Total Dissolved solids	1787	mg/L	APHA, 23rd Edition 2017/ 2540-C
4.	Total Suspended solids	BDL(<1.0)	mg/L	APHA, 23rd Edition 2017/ 2540-D
5.	Calcium	57.7	mg/L	APHA, 23rd Edition 2017/3500-Ca-B
6.	Magnesium	100.6	mg/L	APHA, 23rd Edition 2017/3500-Mg-B
7.	Conductivity	2.68	µS/Cm	APHA, 23rd Edition 2017 Laboratry Method 2510B
8.	Alkalinity	499	mg/L	APHA, 23rd Edition 2017 Titration Method 2320-B
9.	Phosphate	2.6	mg/L	APHA, 23rd Edition 2017Stannous Chloride Method 4500- PD
10.	Nitrate as NO_3	36.9	mg/L	APHA, 23rd Edition 2017UV Spectrometer screening Method 4500 NO_3-B
11.	Nitrate as NO_2	1.2	mg/L	APHA 23rd Editions 2017 4500
12.	Sulphate as SO_4	114.5	mg/L	APHA, 23rd Edition 2017UV Turbidimetric Method 4500 SO_4

A. A. Jalori

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 15/11/2022
Report No : A2ZELPL/SW/11/2022/01

Description of Sample:					
Date of Sampling	:	07/11/2022	**Type of Sampling**	:	Surface Water
Date of Sample Received	:	09/11/2022	**Sample ID**	:	SW/112022/01
Sampling Location of Sampling Point	:	NEAR JETTY AREA HAZIRA DPT	**Sample Particular**	:	MARIN WATER
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	------
Sample Quantity /Total No.	:	2 Litre/1Nos.	**Date of Analysis Start**	:	09/11/2022
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	10/11/2022
Environment condition during the test	:	25 ± 3 °C			

Test Results

Sr. No.	Parameters	Results	Unit	Reference Method
1.	pH	7.36	-	APHA, 23rd Edition 2017/4500-H+ B
2.	Turbidity	77	NTU	--------
3.	Temperature	26.5	°C	APHA, 23rd Edition 2017/2550B

A.A.Jalori

Tested By
(Sr. Analyst/Analyst)

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TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 15/11/2022
Report No : A2ZELPL/AA/112022/01

Description of Sample:					
Date of Sampling	:	07/11/2022	Type of Sampling	:	AIR
Date of Sample Received	:	09/11/2022	Sample ID	:	AA/112022/01
Sampling Location of Sampling Point	:	Near Driver Rest Room Hazira DPT	Sample Particular	:	AMBIENT AIR
Sample Collected / Submitted by	:	A2ZELPL Team Member	Reference Method for Sampling	:	-----
Sample Quantity /Total No.	:	1	Date of Analysis Start	:	09/11/2022
Details of Packing/Label/Seal	:	Satisfactory	Date of Analysis Completion	:	11/11/2022
Environment condition during the test	:	25 ± 3 ° C	Metrological conditions during monitoring		Clear Sky
Instrument code	:	A2ZELPL/RDS/01 A2ZELPL/FDS/01	Actual Duration of Monitoring (Hours)		24

TEST RESULT (COMPARE WITH NAAQS)

Sr. No.	Parameters	Results	Unit	Reference Method
1.	Particulate Matter PM_{10}	43.1	µg/m3	IS 5182 (Part 23)2006/ Reaffirmed 2017
2.	Particulate Matter $PM_{2.5}$	23.4	µg/m3	IS 5182 (Part 24)2019
3.	Sulfur Dioxide SO_2	17.6	µg/m3	IS 5182 (Part 2)2001/ Reaffirmed 2017
4.	Nitrogen Dioxide NO_2	14.2	µg/m3	IS 5182 (Part 6)2006/ Reaffirmed 2017
5.	Wind Speed	23.2	km/h	-----
6.	Wind Direction	ENE-WSW	--	-----
7.	Tempreture	27.3	°C	-----

A.A.Jd 10x;
Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 15/11/2022
Report No : A2ZELPL/AN/112022/01

Description of Sample:					
Date of Sampling	:	07/11/2022	**Type of Sampling**	:	NOISE
Date of Sample Received	:	07/11/2022	**Sample ID**	:	AN/112022/01
Sampling Location of Sampling Point	:	HAZIRA PORT DPT	**Sample Particular**	:	-----
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	IS 9989-1991
Instrument calibration status	:	OK	**Date of Analysis Start**	:	-----
Metrological conditions during monitoring	:	CLEAR SKY	**Date of Analysis Completion**	:	7/11/2022
Instrument code	:	A2ZELPL/SLM/01	**Actual Duration of Monitoring (MINUTE)**		30

Test Results

Sr. No.	LOCATION	L10 dB	L50 dB	L90 dB	CPCB LIMIT	UNIT	REFERENCE METHOD
1	Nr Turning jetty	73.1	44.6	34.8	75	dB	IS 9989-1991
2	Nr.Terminal	65.3	36.4	21.5	75	dB	IS 9989-1991
3	Nr. D.G set	72.7	43.2	32.9	75	dB	IS 9989-1991

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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---------- **End of Report** ----------

ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 15/11/2022
Report No : A2ZELPL/DW/112022/01

Description of Sample:					
Date of Sampling	:	07/11/2022	**Type of Sampling**	:	Drinking Water
Date of Sample Received	:	09/11/2022	**Sample ID**	:	DW/112022/01
Sampling Location of Sampling Point	:	Admin Office Hazira port DPT	**Sample Particular**	:	Drinking Water
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	IS 3025 (Part-1)
Sample Quantity /Total No.	:	2 Litre/1Nos.	**Date of Analysis Start**	:	09/11/2022
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	11/11/2022
Environment condition during the test	:	25 ± 3 °C			

TEST RESULT (COMPARE WITH IS 10500:2012)

Sr. No.	Parameters	Results	Unit	Reference Method
1.	pH	8.19	-	APHA, 23rd Edition 2017/4500-H+ B
2.	Total organic carbon	0.6945	mg/L	
3.	Total Dissolved solids	1755	mg/L	APHA, 23rd Edition 2017/ 2540-C
4.	Total Suspended solids	BDL(<1.0)	mg/L	APHA, 23rd Edition 2017/ 2540-D
5.	Calcium	42.5	mg/L	APHA, 23rd Edition 2017/3500-Ca-B
6.	Magnesium	99.6	mg/L	APHA, 23rd Edition 2017/3500-Mg-B
7.	Conductivity	2.74	mS/Cm	APHA, 23rd Edition 2017 Laboratory Method 2510B
8.	Alkalinity	455.4	mg/L	APHA, 23rd Edition 2017 Titration Method 2320-B
9.	Phosphate	0.72	mg/L	APHA, 23rd Edition 2017Stannous Chloride Method 4500- PD
10.	Nitrate as NO_3	32.03	mg/L	APHA, 23rd Edition 2017UV Spectrometer screening Method 4500 NO_3-B
11.	Nitrate as NO_2	0.05	mg/L	APHA 23rd Editions 2017 4500
12.	Sulphate as SO_4	73.9	mg/L	APHA, 23rd Edition 2017UV Turbidimetric Method 4500 SO_4

A. A. Jalori
Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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Akbarkhan Jalori
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A 2 Z ENVIROTECH LAB PVT.LTD.

A2Z

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TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-04
Date of Report : 15-11-2022
Report No : A2ZELPL/S/112022/01

Description of Sample:					
Date of Sampling	:	07-11-2022	**Type of Sampling**	:	Composite
Date of Sample Received	:	09-11-2022	**Sample ID**	:	S/112022/01
Sampling Location of Sampling Point	:	NEAR JETTY AREA HAZIRA DPT	**Sample Particular**	:	Soil
Sample Collected / Submitted by	:	A2ZELPL Member	**Reference Method for Sampling**	:	SOP
Sample Quantity /Total No.	:	1 Kg/1Nos.	**Date of Analysis Start**	:	09-11-2022
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	11-11-2022
Environment condition during the test	:	25 ± 3 ° C			

Test Results

Sr. No.	Parameters	Unit	Results	Reference Method
1.	Available Phosphorus as P	mg/kg	153.9	IS 6361:1971/Reaffirmed 2020
2.	Organic matter	%	0.68	IS 2720 (Part 22) 1972/Reaffirmed 2015
3.	Total Soluble Sulphates	mg/kg	61.3	IS :2720 (Part 28)1976/ Reaffirmed 2015

A. A. Jalori

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
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---------- **End of Report** ----------

A2Z ENVIROTECH LAB PVT . LTD .

A2ZELPL/DPT/2022/15/05

DATE : 18-12-2022

To,

The Superintending Engineer(PL)& I/C Environment Cell

Deendayal Port Trust.

Gandhidham, (Kachchh)

Subject : Monitoring Report Month of December -2022

Ref. : Work Order No. : EG/WK/3581/15/V/179 DATE 15/09/2022

Name of Work : "Development of 600 m Waterfront and 24 ha. Back up Area at Hazira, Surat by Deendayal Port Authority

Dear Sir,

As per your work order NO. EG/WK/3581/15/V/179 DATE 15/09/2022 our working Report month of December attached herewith.

SR.NO.	Monitoring	Report No.
1	Ambient Air Monitoring	A2ZELPL/AA/12/2022/15
2	Drinking Water	A2ZELPL/DW/12/2022/02
3	Sediment	A2ZELPL/S/12/2022/01
4	Surface Water	A2ZELPL/SW/12/2022/01
5	Noise	A2ZELPL/AN/12/2022/08

Thanking you,

For A2Z ENVIROTECH LAB PVT. LTD.

DIRECTOR

Manager (Env.) / Shri. Padalia EMC

26/12

361
26/12/22

A2Z Envirotech Lab Pvt. Ltd.
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Akbarkhan Jalori
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ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 18/12/2022
Report No : A2ZELPL/AA/122022/15

Description of Sample:					
Date of Sampling	:	08/12/2022	**Type of Sampling**	:	AIR
Date of Sample Received	:	10/12/2022	**Sample ID**	:	AA/122022/15
Sampling Location of Sampling Point	:	Near Driver Rest Room Hazira DPT	**Sample Particular**	:	AMBIENT AIR
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	-----
Sample Quantity /Total No.	:	1	**Date of Analysis Start**	:	10/12/2022
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	12/12/2022
Environment condition during the test	:	25 ± 3 °C	**Metrological conditions during monitoring**		Clear Sky
Instrument code	:	A2ZELPL/RDS/01 A2ZELPL/FDS/01	**Actual Duration of Monitoring (Hours)**		24

TEST RESULT (COMPARE WITH NAAQS)

Sr. No.	Parameters	Results	Unit	Reference Method
1.	Particulate Matter PM_{10}	41.9	µg/m3	IS 5182 (Part 23)2006/ Reaffirmed 2017
2.	Particulate Matter $PM_{2.5}$	22.3	µg/m3	IS 5182 (Part 24)2019
3.	Sulfur Dioxide SO_2	15.7	µg/m3	IS 5182 (Part 2)2001/ Reaffirmed 2017
4.	Nitrogen Dioxide NO_2	12.8	µg/m3	IS 5182 (Part 6)2006/ Reaffirmed 2017
5.	Wind Speed	12.5	km/h	-----
6.	Wind Direction	NE-SW	--	-----
7.	Tempreture	24.8	°C	-----

A. A. Jalori

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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---------- **End of Report** ----------

A 2 Z ENVIROTECH LAB PVT. LTD.

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TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 18/12/2022
Report No : A2ZELPL/DW/122022/02

Description of Sample:					
Date of Sampling	:	08/12/2022	**Type of Sampling**	:	Drinking Water
Date of Sample Received	:	10/12/2022	**Sample ID**	:	DW/122022/01
Sampling Location of Sampling Point	:	Admin Office Hazira port DPT	**Sample Particular**	:	Drinking Water
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	IS 3025 (Part-1)
Sample Quantity /Total No.	:	2 Litre/1Nos.	**Date of Analysis Start**	:	10/12/2022
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	13/12/2022
Environment condition during the test	:	25 ± 3 °C			

TEST RESULT (COMPARE WITH IS 10500:2012)

Sr. No.	Parameters	Results	Unit	Reference Method
1.	pH	8.21	-	APHA, 23rd Edition 2017/4500-H+ B
2.	Total organic carbon	0.6945	mg/L	
3.	Total Dissolved solids	921.7	mg/L	APHA, 23rd Edition 2017/ 2540-C
4.	Total Suspended solids	3.5	mg/L	APHA, 23rd Edition 2017/ 2540-D
5.	Calcium	36.9	mg/L	APHA, 23rd Edition 2017/3500-Ca-B
6.	Magnesium	99.1	mg/L	APHA, 23rd Edition 2017/3500-Mg-B
7.	Conductivity	1.39	mS/Cm	APHA, 23rd Edition 2017 Laboratory Method 2510B
8.	Alkalinity	196	mg/L	APHA, 23rd Edition 2017 Titration Method 2320-B
9.	Phosphate	0.8	mg/L	APHA, 23rd Edition 2017Stannous Chloride Method 4500- PD
10.	Nitrate as NO_3	28.3	mg/L	APHA, 23rd Edition 2017UV Spectrometer screening Method 4500 NO_3-B
11.	Nitrate as NO_2	0.18	mg/L	APHA 23rd Editions 2017 4500
12.	Sulphate as SO_4	112.8	mg/L	APHA, 23rd Edition 2017UV Turbidimetric Method 4500 SO_4

A. P. Jalori

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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End of Report

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Akbarkhan Jalori
+ 91 98987 11906

A 2 Z ENVIROTECH LAB PVT. LTD.

A2Z ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-04
Date of Report : 18-12-2022
Report No : A2ZELPL/S/122022/01

Description of Sample:					
Date of Sampling	:	08-12-2022	**Type of Sampling**	:	Composite
ate of Sample Received	:	10-12-2022	**Sample ID**	:	S/122022/01
Sampling Location of Sampling Point	:	NEAR JETTY AREA HAZIRA DPT	**Sample Particular**	:	Soil
Sample Collected / Submitted by	:	A2ZELPL Member	**Reference Method for Sampling**	:	SOP
Sample Quantity /Total No.	:	1 Kg/1Nos.	**Date of Analysis Start**	:	10-12-2022
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	13-12-2022
Environment condition during the test	:	25 ± 3 °C			

Test Results

Sr. No.	Parameters	Unit	Results	Reference Method
1.	Available Phosphorus as P	mg/kg	159.6	IS 6361:1971/Reaffirmed 2020
2.	Organic matter	%	0.73	IS 2720 (Part 22) 1972/Reaffirmed 2015
3.	Total Soluble Sulphates	mg/kg	67.5	IS :2720 (Part 28)1976/ Reaffirmed 2015

A. A. Jalori

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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End of Report

ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 18/12/2022
Report No : A2ZELPL/SW/12/2022/01

Description of Sample:					
Date of Sampling	:	08/12/2022	**Type of Sampling**	:	Surface Water
Date of Sample Received	:	10/12/2022	**Sample ID**	:	SW/122022/01
Sampling Location of Sampling Point	:	NEAR JETTY AREA HAZIRA DPT	**Sample Particular**	:	MARIN WATER
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	------
Sample Quantity /Total No.	:	2 Litre/1Nos.	**Date of Analysis Start**	:	10/12/2022
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	13/12/2022
Environment condition during the test	:	25 ± 3 °C			

Test Results

Sr. No.	Parameters	Results	Unit	Reference Method
1.	pH	7.12	-	APHA, 23rd Edition 2017/4500-H+ B
2.	Turbidity	74	NTU	--------
3.	Temperature	25.7	°C	APHA, 23rd Edition 2017/2550B

A. A. Jalori

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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TC-10331

TEST REPORT

Customer's Name and Address:
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DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 18/12/2022
Report No : A2ZELPL/AN/122022/08

Description of Sample:					
Date of Sampling	:	08/12/2022	**Type of Sampling**	:	NOISE
Date of Sample Received	:	08/12/2022	**Sample ID**	:	AN/122022/08
Sampling Location of Sampling Point	:	HAZIRA PORT DPT	**Sample Particular**	:	-----
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	IS 9989-1991
Instrument calibration status	:	OK	**Date of Analysis Start**	:	-----
Metrological conditions during monitoring	:	CLEAR SKY	**Date of Analysis Completion**	:	08/12/2022
Instrument code	:	A2ZELPL/SLM/01	**Actual Duration of Monitoring (MINUTE)**		30

Test Results

Sr. No.	LOCATION	L10 dB	L50 dB	L90 dB	CPCB LIMIT	UNIT	REFERENCE METHOD
1	Nr Turning jetty	77.3	44.7	35.1	75	dB	IS 9989-1991
2	Nr.Terminal	66.9	38.2	20.5	75	dB	IS 9989-1991
3	Nr. D.G set	76.1	45.2	31.3	75	dB	IS 9989-1991

A. A. Jalori
Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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---------- **End of Report** ----------

A2Z ENVIROTECH LAB PVT . LTD .

A2ZELPL/DPT/2023/01/06

DATE : 16-01-2023

To,

The Superintending Engineer(PL)& I/C Environment Celi

Deendayal Port Trust.

Gandhidham, (Kachchh)

Subject : Monitoring Report Month of January-2023

Ref. : Work Order No. : EG/WK/3581/15/V/179 DATE 15/09/2022

Name of Work : "Development of 600 m Waterfront and 24 ha. Back up Area at Hazira, Surat by Deendayal Port Authority

Dear Sir,

As per your work order NO. EG/WK/3581/15/V/179 DATE 15/09/2022 our working Report month of December attached herewith.

SR.NO.	Monitoring	Report No.
1	Ambient Air Monitoring	A2ZELPL/AA/01/2023/01
2	Drinking Water	A2ZELPL/DW/01/2023/01
3	Sediment	A2ZELPL/S/01/2023/01
4	Surface Water	A2ZELPL/SW/01/2023/01
5	Noise	A2ZELPL/AN/01/2023/01

366(PL)
16/01/23

Thanking you,

Manager (Env.) / Shiv Padalia
EMC

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ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 16/01/2023
Report No : A2ZELPL/AA/012023/01

Description of Sample:					
Date of Sampling	:	06/01/2023	**Type of Sampling**	:	AIR
Date of Sample Received	:	08/01/2023	**Sample ID**	:	AA/012023/01
Sampling Location of Sampling Point	:	Near Driver Rest Room Hazira DPT	**Sample Particular**	:	AMBIENT AIR
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	-----
Sample Quantity /Total No.	:	1	**Date of Analysis Start**	:	09/01/2023
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	11/01/2023
Environment condition during the test	:	25 ± 3 °C	**Metrological conditions during monitoring**		Clear Sky
Instrument code	:	A2ZELPL/RDS/01 A2ZELPL/FDS/01	**Actual Duration of Monitoring (Hours)**		24

TEST RESULT (COMPARE WITH NAAQS)

Sr. No.	Parameters	Results	Unit	Reference Method
1.	Particulate Matter PM_{10}	39.3	µg/m3	IS 5182 (Part 23)2006/ Reaffirmed 2017
2.	Particulate Matter $PM_{2.5}$	21.9	µg/m3	IS 5182 (Part 24)2019
3.	Sulfur Dioxide SO_2	13.1	µg/m3	IS 5182 (Part 2)2001/ Reaffirmed 2017
4.	Nitrogen Dioxide NO_2	11.4	µg/m3	IS 5182 (Part 6)2006/ Reaffirmed 2017
5.	Wind Speed	10	km/h	-----
6.	Wind Direction	WNW-ESE	--	-----
7.	Tempreture	24.0	°C	-----

A. A. Jalori

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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---------- **End of Report** ----------

A 2 Z ENVIROTECH LAB PVT. LTD.

ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 16/01/2023
Report No : A2ZELPL/DW/012023/01

Description of Sample:					
Date of Sampling	:	06/01/2023	**Type of Sampling**	:	Drinking Water
Date of Sample Received	:	08/01/2023	**Sample ID**	:	DW/012023/01
Sampling Location of Sampling Point	:	Admin Office Hazira port DPT	**Sample Particular**	:	Drinking Water
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	IS 3025 (Part-1)
Sample Quantity /Total No.	:	2 Litre/1Nos.	**Date of Analysis Start**	:	09/01/2023
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	13/01/2023
Environment condition during the test	:	25 ± 3 °C			

TEST RESULT (COMPARE WITH IS 10500:2012)

Sr. No.	Parameters	Results	Unit	Reference Method
1.	pH	8.28	-	APHA, 23rd Edition 2017/4500-H+ B
2.	Total organic carbon	0.6279	mg/L	-----
3.	Total Dissolved solids	1315.1	mg/L	APHA, 23rd Edition 2017/ 2540-C
4.	Total Suspended solids	5.1	mg/L	APHA, 23rd Edition 2017/ 2540-D
5.	Calcium	48.1	mg/L	APHA, 23rd Edition 2017/3500-Ca-B
6.	Magnesium	92.3	mg/L	APHA, 23rd Edition 2017/3500-Mg-B
7.	Conductivity	2.28	mS/Cm	APHA, 23rd Edition 2017 Laboratory Method 2510B
8.	Alkalinity	218.1	mg/L	APHA, 23rd Edition 2017 Titration Method 2320-B
9.	Phosphate	0.74	mg/L	APHA, 23rd Edition 2017Stannous Chloride Method 4500- PD
10.	Nitrate as NO_3	32	mg/L	APHA, 23rd Edition 2017UV Spectrometer screening Method 4500 NO_3-B
11.	Nitrate as NO_2	0.11	mg/L	APHA 23rd Editions 2017 4500
12.	Sulphate as SO_4	109.6	mg/L	APHA, 23rd Edition 2017UV Turbidimetric Method 4500 SO_4

A. A. Jalori
Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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---------- **End of Report** ----------

ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-04
Date of Report : 16-01-2023
Report No : A2ZELPL/S/012023/01

Description of Sample:					
Date of Sampling	:	06-01-2023	**Type of Sampling**	:	Composite
Date of Sample Received	:	08-01-2023	**Sample ID**	:	S/012023/01
Sampling Location of Sampling Point	:	NEAR JETTY AREA HAZIRA DPT	**Sample Particular**	:	Soil
Sample Collected / Submitted by	:	A2ZELPL Member	**Reference Method for Sampling**	:	SOP
Sample Quantity /Total No.	:	1 Kg/1Nos.	**Date of Analysis Start**	:	09-01-2023
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	12-01-2023
Environment condition during the test	:	25 ± 3 °C			

Test Results

Sr. No.	Parameters	Unit	Results	Reference Method
1.	Available Phosphorus as P	mg/kg	152.8	IS 6361:1971/Reaffirmed 2020
2.	Organic matter	%	0.69	IS 2720 (Part 22) 1972/Reaffirmed 2015
3.	Total Soluble Sulphates	mg/kg	63.5	IS :2720 (Part 28)1976/ Reaffirmed 2015

A. A. Jalori

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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End of Report

ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 16/01/2023
Report No : A2ZELPL/SW/01/2023/01

Description of Sample:					
Date of Sampling	:	06/01/2023	**Type of Sampling**	:	Surface Water
Date of Sample Received	:	08/01/2023	**Sample ID**	:	SW/012023/01
Sampling Location of Sampling Point	:	NEAR JETTY AREA HAZIRA DPT	**Sample Particular**	:	MARIN WATER
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	------
Sample Quantity /Total No.	:	2 Litre/1Nos.	**Date of Analysis Start**	:	09/01/2023
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	12/01/2023
Environment condition during the test	:	25 ± 3 °C			

Test Results

Sr. No.	Parameters	Results	Unit	Reference Method
1.	pH	7.64	-	APHA, 23rd Edition 2017/4500-H+ B
2.	Turbidity	68	NTU	--------
3.	Temperature	25.3	° C	APHA, 23rd Edition 2017/2550B

A. A. Jalori
Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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Akbarkhan Jalori
+ 91 98987 11906

A2Z ENVIROTECH LAB PVT. LTD.

TEST REPORT

Customer's Name and Address	Format No.	: 7.8 F-01
SE(PL) & EMC (I/C),AO BUILDING	Date of Report	: 16/01/2023
DEENDAYAL PORT AUTHORITY	Report No	: A2ZELPL/AN/012023/01
GANDHIDHAM KACHCHH		
WORK ORDER NO. EG/WK/3581/15.3./170		

Description of Sample:

Date of Sampling	06/01/2023	**Type of Sampling**	NOISE
Date of Sample Received	0/01/2023	**Sample ID**	AN/012023/01
Sampling Location of Sampling Point	HAZIRA PORT DPT	**Sample Particular**	-----
Sample Collected / Submitted by	A2ZELPL Team Member	**Reference Method for Sampling**	IS 9989-1991
Instrument calibration status	OK	**Date of Analysis Start**	-----
Metrological conditions during monitoring	CLEAR SKY	**Date of Analysis Completion**	06/01/2023
Instrument code	A2ZELPL/SLM/01	**Actual Duration of Monitoring (MINUTE)**	30

Test Results

Sr. No.	LOCATION	L10 dB	L50 dB	L90 dB	CPCB LIMIT	UNIT	REFERENCE METHOD
1	Nr Turning jetty	73.1	45.1	34.7	75	dB	IS 9989-1991
2	Nr.Terminal	67.2	40.5	22.3	75	dB	IS 9989-1991
3	Nr. D.G set	73.5	43.6	30.0	75	dB	IS 9989-1991

A.P. Jalori

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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End of Report

A2Z ENVIROTECH LAB PVT . LTD .

A2ZELPL/DPT/2023/02/08

DATE: 24-02-2023

To,

The Superintending Engineer (PL) & I/C Environment Cell

Deendayal Port Trust.

Gandhidham, (Kachchh)

Subject: Monitoring Report Month of February-2023

Ref.: Work Order No. : EG/WK/3581/15/V/179 DATE 15/09/2022

Name of Work : "Development of 600 m Waterfront and 24 ha. Back up Area at Hazira, Surat by Deendayal Port Authority

Dear Sir,

As per your work order NO. EG/WK/3581/15/V/179 DATE 15/09/2022 our working Report month of February-2023 attached herewith.

SR.NO.	Monitoring	Report No.
1	Ambient Air Monitoring	A2ZELPL/AA/02/2023/01
2	Drinking Water	A2ZELPL/DW/02/2023/01
3	Sediment	A2ZELPL/S/02/2023/01
4	Surface Water	A2ZELPL/SW/02/2023/01
5	Noise	A2ZELPL/AN/02/2023/01

Thanking you,

373(PL)
28/02/23

Manager (Env) / Shri Pradeep Emc

28/2

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A 2 Z ENVIROTECH LAB PVT. LTD.

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TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 16/02/2023
Report No : A2ZELPL/AA/022023/01

Description of Sample:					
Date of Sampling	:	09/02/2023	**Type of Sampling**	:	AIR
Date of Sample Received	:	11/02/2023	**Sample ID**	:	AA/022023/01
Sampling Location of Sampling Point	:	Near Driver Rest Room Hazira DPT	**Sample Particular**	:	AMBIENT AIR
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	-----
Sample Quantity /Total No.	:	1	**Date of Analysis Start**	:	12/02/2023
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	14/02/2023
Environment condition during the test	:	25 ± 3 °C	**Metrological conditions during monitoring**		Clear Sky
Instrument code	:	A2ZELPL/RDS/01 A2ZELPL/FDS/01	**Actual Duration of Monitoring (Hours)**		24

TEST RESULT (COMPARE WITH NAAQS)

Sr. No.	Parameters	Results	Unit	Reference Method
1.	Particulate Matter PM_{10}	40.7	µg/m3	IS 5182 (Part 23)2006/ Reaffirmed 2017
2.	Particulate Matter $PM_{2.5}$	23.5	µg/m3	IS 5182 (Part 24)2019
3.	Sulfur Dioxide SO_2	15.8	µg/m3	IS 5182 (Part 2)2001/ Reaffirmed 2017
4.	Nitrogen Dioxide NO_2	13.2	µg/m3	IS 5182 (Part 6)2006/ Reaffirmed 2017
5.	Wind Speed	11.3	km/h	-----
6.	Wind Direction	WSW-ENE	--	-----
7.	Tempreture	24.9	°C	-----

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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---------- **End of Report** ----------

A 2 Z ENVIROTECH LAB PVT. LTD.

A2Z ENVIROTECH LAB PVT . LTD .

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TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 16/02/2023
Report No : A2ZELPL/DW/022023/01

Description of Sample:					
Date of Sampling	:	09/02/2023	**Type of Sampling**	:	Drinking Water
Date of Sample Received	:	11/02/2023	**Sample ID**	:	DW/022023/01
Sampling Location of Sampling Point	:	Admin Office Hazira port DPT	**Sample Particular**	:	Drinking Water
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	IS 3025 (Part-1)
Sample Quantity /Total No.	:	2 Litre/1Nos.	**Date of Analysis Start**	:	12/02/2023
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	15/02/2023
Environment condition during the test	:	25 ± 3 °C			

TEST RESULT (COMPARE WITH IS 10500:2012)

Sr. No.	Parameters	Results	Unit	Reference Method
1.	pH	8.49	-	APHA, 23rd Edition 2017/4500-H^+ B
2.	Total organic carbon	0.5912	mg/L	-----
3.	Total Dissolved solids	1447	mg/L	APHA, 23rd Edition 2017/ 2540-C
4.	Total Suspended solids	6.3	mg/L	APHA, 23rd Edition 2017/ 2540-D
5.	Calcium	45.7	mg/L	APHA, 23rd Edition 2017/3500-Ca-B
6.	Magnesium	91.4	mg/L	APHA, 23rd Edition 2017/3500-Mg-B
7.	Conductivity	2.2	mS/Cm	APHA, 23rd Edition 2017 Laboratory Method 2510B
8.	Alkalinity	226.8	mg/L	APHA, 23rd Edition 2017 Titration Method 2320-B
9.	Phosphate	0.41	mg/L	APHA, 23rd Edition 2017Stannous Chloride Method 4500- PD
10.	Nitrate as NO_3	32.4	mg/L	APHA, 23rd Edition 2017UV Spectrometer screening Method 4500 NO_3-B
11.	Nitrate as NO_2	0.12	mg/L	APHA 23rd Editions 2017 4500
12.	Sulphate as SO_4	106.8	mg/L	APHA, 23rd Edition 2017UV Turbidimetric Method 4500 SO_4

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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---------- **End of Report** ----------

A2Z ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-04
Date of Report : 16-02-2023
Report No : A2ZELPL/S/022023/01

Description of Sample:					
Date of Sampling	:	09-02-2023	**Type of Sampling**	:	Composite
Date of Sample Received	:	11-02-2023	**Sample ID**	:	S/022023/01
Sampling Location of Sampling Point	:	NEAR JETTY AREA HAZIRA DPT	**Sample Particular**	:	Soil
Sample Collected / Submitted by	:	A2ZELPL Member	**Reference Method for Sampling**	:	SOP
Sample Quantity /Total No.	:	1 Kg/1Nos.	**Date of Analysis Start**	:	12-02-2023
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	15-02-2023
Environment condition during the test	:	25 ± 3 °C			

Test Results

Sr. No.	Parameters	Unit	Results	Reference Method
1.	Available Phosphorus as P	mg/kg	157.1	IS 6361:1971/Reaffirmed 2020
2.	Organic matter	%	0.73	IS 2720 (Part 22) 1972/Reaffirmed 2015
3.	Total Soluble Sulphates	mg/kg	65.4	IS :2720 (Part 28)1976/ Reaffirmed 2015

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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A2Z ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 16/02/2023
Report No : A2ZELPL/SW/02/2023/01

Description of Sample:					
Date of Sampling	:	10/02/2023	**Type of Sampling**	:	Surface Water
Date of Sample Received	:	11/02/2023	**Sample ID**	:	SW/022023/01
Sampling Location of Sampling Point	:	NEAR JETTY AREA HAZIRA DPT	**Sample Particular**	:	MARIN WATER
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	------
Sample Quantity /Total No.	:	2 Litre/1Nos.	**Date of Analysis Start**	:	12/02/2023
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	14/02/2023
Environment condition during the test	:	25 ± 3 °C			

Test Results

Sr. No.	Parameters	Results	Unit	Reference Method
1.	pH	7.68	-	APHA, 23rd Edition 2017/4500-H+ B
2.	Turbidity	72.5	NTU	--------
3.	Temperature	25.7	°C	APHA, 23rd Edition 2017/2550B

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
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(Quality Manager)

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A2Z ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 16/02/2023
Report No : A2ZELPL/AN/022023/01

Description of Sample:					
Date of Sampling	:	10/02/2023	**Type of Sampling**	:	NOISE
Date of Sample Received	:	10/02/2023	**Sample ID**	:	AN/022023/01
Sampling Location of Sampling Point	:	HAZIRA PORT DPT	**Sample Particular**	:	-----
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	IS 9989-1991
Instrument calibration status	:	OK	**Date of Analysis Start**	:	-----
Metrological conditions during monitoring	:	CLEAR SKY	**Date of Analysis Completion**	:	10/02/2023
Instrument code	:	A2ZELPL/SLM/01	**Actual Duration of Monitoring (MINUTE)**		30

Test Results

Sr. No.	LOCATION	L10 dB	L50 dB	L90 dB	CPCB LIMIT	UNIT	REFERENCE METHOD
1	Nr Turning jetty	74.1	47.6	36.4	75	dB	IS 9989-1991
2	Nr.Terminal	69.2	42.2	23.8	75	dB	IS 9989-1991
3	Nr. D.G set	74.4	44.9	32.3	75	dB	IS 9989-1991

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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---------- **End of Report** ----------

A2Z ENVIROTECH LAB PVT . LTD .

A2ZELPL/DPT/2023/03/09

DATE: 17-03-2023

To,

The Superintending Engineer (PL) & I/C Environment Cell

Deendayal Port Trust.

Gandhidham, (Kachchh)

Subject: Monitoring Report Month of March-2023

Ref.: Work Order No. : EG/WK/3581/15/V/179 DATE 15/09/2022

Name of Work : "Development of 600 m Waterfront and 24 ha. Back up Area at Hazira, Surat by Deendayal Port Authority

Dear Sir,

As per your work order NO. EG/WK/3581/15/V/179 DATE 15/09/2022 our working Report month of March-2023 attached herewith.

SR.NO.	Monitoring	Report No.
1	Ambient Air Monitoring	A2ZELPL/AA/03/2023/01
2	Drinking Water	A2ZELPL/DW/03/2023/01
3	Sediment	A2ZELPL/S/03/2023/01
4	Surface Water	A2ZELPL/SW/03/2023/01
5	Noise	A2ZELPL/AN/03/2023/01

Thanking you,

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ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 16/03/2023
Report No : A2ZELPL/AA/032023/01

Description of Sample:					
Date of Sampling	:	10/03/2023	**Type of Sampling**	:	AIR
Date of Sample Received	:	12/03/2023	**Sample ID**	:	AA/032023/01
Sampling Location of Sampling Point	:	Near Driver Rest Room Hazira DPT	**Sample Particular**	:	AMBIENT AIR
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	-----
Sample Quantity /Total No.	:	1	**Date of Analysis Start**	:	12/03/2023
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	14/03/2023
Environment condition during the test	:	25 ± 3 ° C	**Metrological conditions during monitoring**		Clear Sky
Instrument code	:	A2ZELPL/RDS/01 A2ZELPL/FDS/01	**Actual Duration of Monitoring (Hours)**		24

TEST RESULT (COMPARE WITH NAAQS)

Sr. No.	Parameters	Results	Unit	Reference Method
1.	Particulate Matter PM_{10}	41.3	µg/m3	IS 5182 (Part 23)2006/ Reaffirmed 2017
2.	Particulate Matter $PM_{2.5}$	24.6	µg/m3	IS 5182 (Part 24)2019
3.	Sulfur Dioxide SO_2	17.2	µg/m3	IS 5182 (Part 2)2001/ Reaffirmed 2017
4.	Nitrogen Dioxide NO_2	15,5	µg/m3	IS 5182 (Part 6)2006/ Reaffirmed 2017
5.	Wind Speed	9.8	km/h	-----
6.	Wind Direction	WSW-ENE	--	-----
7.	Tempreture	26.2	°C	-----

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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End of Report

A 2 Z ENVIROTECH LAB PVT. LTD.

A2Z ENVIROTECH LAB PVT . LTD .

TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 16/03/2023
Report No : A2ZELPL/DW/032023/01

Description of Sample:					
Date of Sampling	:	11/03/2023	**Type of Sampling**	:	Drinking Water
Date of Sample Received	:	12/03/2023	**Sample ID**	:	DW/032023/01
Sampling Location of Sampling Point	:	Admin Office Hazira port DPT	**Sample Particular**	:	Drinking Water
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	IS 3025 (Part-1)
Sample Quantity /Total No.	:	2 Litre/1Nos.	**Date of Analysis Start**	:	13/03/2023
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	16/03/2023
Environment condition during the test	:	25 ± 3 °C			

TEST RESULT (COMPARE WITH IS 10500:2012)

Sr. No.	Parameters	Results	Unit	Reference Method
1.	pH	8.35	-	APHA, 23rd Edition 2017/4500-H+ B
2.	Total organic carbon	0.4915	mg/L	-----
3.	Total Dissolved solids	1480.3	mg/L	APHA, 23rd Edition 2017/ 2540-C
4.	Total Suspended solids	5.6	mg/L	APHA, 23rd Edition 2017/ 2540-D
5.	Calcium	45.7	mg/L	APHA, 23rd Edition 2017/3500-Ca-B
6.	Magnesium	86.99	mg/L	APHA, 23rd Edition 2017/3500-Mg-B
7.	Conductivity	2.26	mS/Cm	APHA, 23rd Edition 2017 Laboratory Method 2510B
8.	Alkalinity	235.7	mg/L	APHA, 23rd Edition 2017 Titration Method 2320-B
9.	Phosphate	0.4	mg/L	APHA, 23rd Edition 2017Stannous Chloride Method 4500- PD
10.	Nitrate as NO_3	6.38	mg/L	APHA, 23rd Edition 2017UV Spectrometer screening Method 4500 NO_3-B
11.	Nitrate as NO_2	0.1	mg/L	APHA 23rd Editions 2017 4500
12.	Sulphate as SO_4	54.7	mg/L	APHA, 23rd Edition 2017UV Turbidimetric Method 4500 SO_4

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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3. Reanalysis of the sample will be done if requested Within 15 days from the date of reporting of sample if the samples are not consumed during analysis.

End of Report

A 2 Z ENVIROTECH LAB PVT. LTD.

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TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-04
Date of Report : 16-03-2023
Report No : A2ZELPL/S/032023/01

Description of Sample:					
Date of Sampling	:	10-03-2023	**Type of Sampling**	:	Composite
Date of Sample Received	:	12-03-2023	**Sample ID**	:	S/032023/01
Sampling Location of Sampling Point	:	NEAR JETTY AREA HAZIRA DPT	**Sample Particular**	:	Soil
Sample Collected / Submitted by	:	A2ZELPL Member	**Reference Method for Sampling**	:	SOP
Sample Quantity /Total No.	:	1 Kg/1Nos.	**Date of Analysis Start**	:	13-03-2023
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	13-03-2023
Environment condition during the test	:	25 ± 3 °C			

Test Results

Sr. No.	Parameters	Unit	Results	Reference Method
1.	Available Phosphorus as P	mg/kg	162.5	IS 6361:1971/Reaffirmed 2020
2.	Organic matter	%	0.74	IS 2720 (Part 22) 1972/Reaffirmed 2015
3.	Total Soluble Sulphates	mg/kg	67.2	IS :2720 (Part 28)1976/ Reaffirmed 2015

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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TC-10331

TEST REPORT

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 16/03/2023
Report No : A2ZELPL/SW/03/2023/01

Description of Sample:					
Date of Sampling	:	10/03/2023	**Type of Sampling**	:	Surface Water
Date of Sample Received	:	12/03/2023	**Sample ID**	:	SW/032023/01
Sampling Location of Sampling Point	:	NEAR JETTY AREA HAZIRA DPT	**Sample Particular**	:	MARIN WATER
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	------
Sample Quantity /Total No.	:	2 Litre/1Nos.	**Date of Analysis Start**	:	12/03/2023
Details of Packing/Label/Seal	:	Satisfactory	**Date of Analysis Completion**	:	14/03/2023
Environment condition during the test	:	25 ± 3 °C			

Test Results

Sr. No.	Parameters	Results	Unit	Reference Method
1.	pH	7.69	-	APHA, 23rd Edition 2017/4500-H+ B
2.	Turbidity	75.5	NTU	--------
3.	Temperature	26.3	° C	APHA, 23rd Edition 2017/2550B

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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---------- **End of Report** ----------

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ENVIROTECH LAB PVT . LTD .

TEST REPORT

TC-10331

Customer's Name and Address:
SE(PL) & EMC (I/C),AO BUILDING
DEENDAYAL PORT AUTHORITY
GANDHIDHAM-KACHCHH
WORK ORDER NO: EG/WK/3581/15/V/179

Format No. : 7.8 F-01
Date of Report : 16/03/2023
Report No : A2ZELPL/AN/032023/01

Description of Sample:					
Date of Sampling	:	11/03/2023	**Type of Sampling**	:	NOISE
Date of Sample Received	:	11/03/2023	**Sample ID**	:	AN/032023/01
Sampling Location of Sampling Point	:	HAZIRA PORT DPT	**Sample Particular**	:	-----
Sample Collected / Submitted by	:	A2ZELPL Team Member	**Reference Method for Sampling**	:	IS 9989-1991
Instrument calibration status	:	OK	**Date of Analysis Start**	:	-----
Metrological conditions during monitoring	:	CLEAR SKY	**Date of Analysis Completion**	:	11/03/2023
Instrument code	:	A2ZELPL/SLM/01	**Actual Duration of Monitoring (MINUTE)**		30

Test Results

Sr. No.	LOCATION	L10 dB	L50 dB	L90 dB	CPCB LIMIT	UNIT	REFERENCE METHOD
1	Nr Turning jetty	74.5	44.3	33.6	75	dB	IS 9989-1991
2	Nr.Terminal	67.9	41.6	22.4	75	dB	IS 9989-1991
3	Nr. D.G set	73.5	43.7	30.3	75	dB	IS 9989-1991

Tested By
(Sr. Analyst/Analyst)

Authorized Signatory
Akbarkhan P. Jalori
(Quality Manager)

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---------- **End of Report** ----------

Annexure -6

सत्यमेव जयते

Forests & Environment Department
Government of Gujarat

Monthly Environmental Monitoring Plan (EMP report)

For

"Preparing and Monitoring of Environmental Monitoring and Management Plan for Deendayal Port Authority at Dahej-Hazira-Ghogha for a period of 3 years"

(13th October to 12th November 23)

(Final Report)

Ref. No. GEMI/835(2)/69/2024

Submitted to:

Deendayal Port Authority (DPA), Kandla

Gujarat Environment Management Institute (GEMI)

(An Autonomous Institute of Government of Gujarat)

GEMI Bhavan, 246-247, GIDC Electronic Estate, Sector-25, Gandhinagar-382025

"An ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018 Certified Institute"

ABOUT THIS DOCUMENT

Gujarat Environment Management Institute (GEMI) has been assigned with the project **"Preparing and Monitoring of Environmental Monitoring and Management Plan for Deendayal Port Authority at Dahej-Hazira-Ghogha for a period of 3 years" (Final EMP report for 13th October to 12th November 2023) by Deendayal Port Authority, Kandla.** Under the said project the report titled "Monthly Environmental Monitoring Plan Report *(Final EMP report for 13th October-12th November 2023)"* is prepared.

Name of the Report:	Monthly Environmental Monitoring Plan (EMP report) for "Preparing and Monitoring of Environmental Monitoring and Management Plan for Deendayal Port Authority at Dahej-Hazira-Ghogha for a period of 3 years" *(Final EMP report for 13th October-12th November 2023)*
Date of Issue:	06/03/2024
Version:	1.0
Document Ref.:	GEMI/835(2)/69/2024
Prepared by:	Ms. Ankita Modi, Assistant Environmental Engineer Ms. Jalpa Darji, Deputy Environmental Engineer & Unit Head – 2
Contribution by	Mr. Yagneshkumar Pandit (Project Assistant) Ms. Nishi Shah (Project Assistant) Mr. Nikunj Choksi (Project Assistant) Mr. Ashish Patat (Project Manager, Ghogha) Mr. Pritish Shrimali (Project Manager, Hazira) Mr. Anandgiri Gosai (Project Manager, Dahej)
Reviewed by:	Dr. Nitasha Khatri, Senior Scientific Officer & Lab Head
Approved by:	Dr. Jaipal Singh, IFS, APCCF & Director

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Table of Contents

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List of Tables

List of Figures

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Chapter 1. Introduction

1.1 Introduction

Deendayal Port Authority (Erstwhile Kandla Port Trust) is one of the twelve major ports in India and is located on the West Coast of India, in the Gulf of Kutch at 23001'N and 70013'E in the state of Gujarat in India. DPA has commissioned Ro-Ro/Ro-Pax facilities at Hazira and Ghogha, Gujarat. This waterfront is proposed to be operated for berthing and unberthing of ROPAX Ferry vessels to load and unload vehicles along with embarking and disembarking passengers. The travel time between Ghogha and Hazira has reduced from 10 hours to 3.15 hours with the start of the Ro-Ro ferry service. The road distance from Surat to Bhavnagar is 360 kilometers. Whereas the sea route distance is 67 nautical miles only. So, Ro-Ro/Ro-Pax vessels are deployed to reduce travel time and thereby, reduce carbon emission. In compliance with the conditions stipulated in statutory clearances viz. Environmental/CRZ Clearance from the Ministry of Environment & Forest, CRZ Recommendations from the State Forest & Environment Department, and NOC from the State Pollution Control Board, and to ensure implementation of the project in an environmentally sustainable manner in & around the project site, it is important to monitor the environmental status and prepare an effective Environmental Monitoring and Management Plan of the port facility for sustainable development.

In this regard, Deendayal Port Authority proposes to formulate a detailed and effective environmental monitoring and management plan by conducting monthly environmental monitoring for its onward submission to the statutory bodies.

Under the said study, monitoring of the various aspects of the environment such as Ambient air, DG stack emissions, meteorology, drinking water, soil, noise, and marine environment- Water, Sediment & Ecological characteristics for the locations at Hazira, Dahej & Ghogha for 3 years needs to be carried out.

This report includes the monthly Environmental Monitoring Plan (EMP) Report for monitoring carried out for the month of "13th October-12th November 2023".

1.2 Locations for Environmental Monitoring

Finalized monitoring locations as per the preliminary site visit report are shown in **Table 1** and **Figures 1 to 3**. The monitoring photographs are shown in **Figure 4**.

Table 1: Locations of Environmental Monitoring Components

Locations	Sample code	Latitude	Longitude
Ambient Air Monitoring			
Admin building at Ghogha Ro-Ro ferry	AM-G	21.673483	72.284497
Terminal building at Hazira Ro-Ro ferry	AM-H1	21.077458	72.657147
Staff accommodation at Ro-Ro ferry at Hazira	AM-H2	21.0775717	72.6551994
Admin building at Ro-Ro ferry service at Dahej	AM-D	21.666383	72.561889
Drinking Water Monitoring			
Canteen building at Ghogha Ro-Ro ferry	DW-G	21.677216	72.283060
Terminal building at Hazira Ro-Ro ferry	DW-H	21.077399	72.657189
Canteen building at Ro-Ro ferry service at Dahej	DW-D	21.66435	72.563489
Noise Monitoring			
Admin building at Ghogha Ro-Ro ferry	N-G	21.673481	72.284464
Terminal building at Hazira Ro-Ro ferry	N-H1	21.077458	72.657147
Staff accommodation at Ro-Ro ferry at Hazira	N-H2	21.0775717	72.6551994
Admin building at Ro-Ro Ferry Service at Dahej	N-D	21.666383	72.5561889
Meteorological Data Monitoring			
Admin building at Ghogha Ro-Ro ferry	M-G	21.673483	72.284497
Terminal building at Hazira Ro-Ro ferry	M-H	21.077458	72.657147
Admin building at Ro-Ro Ferry Service at Dahej	M-D	21.666383	72.561889
Soil Quality Monitoring			
Terminal building at Ghogha Ro-Ro ferry	S-G	21.67496	72.284388
Near Terminal building at Hazira Ro-Ro ferry	S-H	21.076353	72.657294
Ro-Ro ferry service at Dahej	S-D	21.666037	72.563489
Marine Water, Ecology and Sediment Monitoring			
Near Ro-Ro ferry terminal at Ghogha	MA-G1	21.67954	72.29433
Away from Ro-Ro ferry terminal at Ghogha and along the ferry route from Ghogha to Hazira	MA-G2	21.665054	72.336313
Near Ro-Ro ferry terminal at Hazira	MA-H1	21.07577	72.65839
Away from Ro-Ro ferry terminal at Hazira and along the ferry route from Hazira to Ghogha	MA-H2	21.072114	72.657794
Near Ro-Ro ferry Service at Dahej	MA-D	21.65988	72.56365
DG stack emission Monitoring			
Near substation-3 at Ghogha Ro-Ro ferry	DG-G	21.6739638	72.2835000
Generator Room near Terminal building at Hazira Ro Ro ferry	DG-H	21.0775041	72.6563279
Near Substation-1 at Dahej Ro-Ro ferry	DG-D	21.665902	72.562056

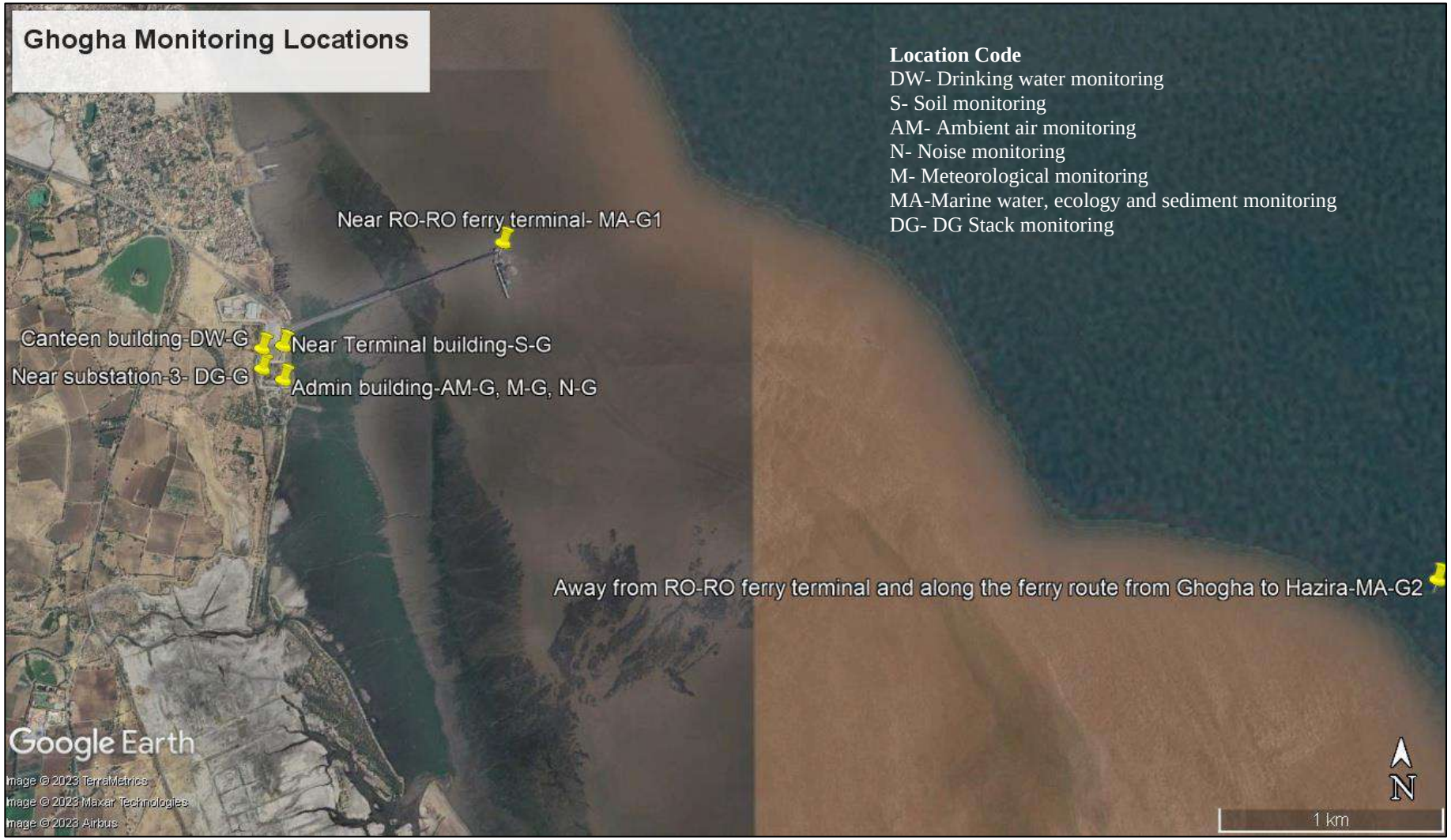

Fig. 1: Sampling locations at Ghogha

Fig. 2: Sampling locations at Hazira

Fig. 3: Sampling locations at Dahej

Fig. 4: Photographs of Environmental Monitoring

1.3 Details of Environmental Monitoring Components

Detailed plan of environmental monitoring components and its parameters is shown in **Table 2.**

Table 2: Detailed Environmental Monitoring Components

Sr. No	Parameter	No. of locations	Frequency	Parameters
1.	Ambient Air Quality Monitoring (4 Locations)	1 at Ghogha, 2 at Hazira and 1 at Dahej	Twice a week	PM_{10}, $PM_{2.5}$, Sulphur Dioxide, Oxides of Nitrogen, Carbon Monoxide
			Once in a month	Hydrocarbons
				Benzene
				Volatile Organic Compound
				Non-methane VOC
2.	Drinking Water Monitoring (3 Locations)	1 at Ghogha, 1 at Hazira and 1 at Dahej	Once in a month	Odor, Color, pH, Turbidity, TDS, TSS, Conductivity, Chloride, Calcium as Ca, Magnesium, Total Hardness, Sulphate as SO_4, Nitrate as NO_3, Nitrite as NO_2, Fluoride as F, Sodium as Na, Iron as Fe, Potassium as K, Manganese, Total Chromium, Hexavalent Chromium, Copper, Cadmium, Arsenic, Lead, Zinc, Mercury, Salinity, Free Residual Chlorine, Microbiological (MPN)
3.	Noise level Monitoring (4 Locations)	1 at Ghogha, 2 at Hazira and 1 at Dahej	24 hrs period once in a month	Leq (Day) & (Night)
4.	Soil Quality Monitoring (3 Locations)	1 at Ghogha, 1 at Hazira and 1 at Dahej	Once in a month	Total Organic Matter, Organic Carbon, Inorganic Phosphate, Texture, pH, Conductivity, Particle size distribution & Silt content, SAR, Water Holding Capacity, Aluminum, Chromium, Nickel, Copper, Zinc, Cadmium, Lead, Arsenic, Mercury
5.	Meteorologi -cal Data Monitoring (3 Locations)	1 at Ghogha, 1 at Hazira and 1 at Dahej	Daily	Wind Speed, Wind Direction, Rainfall, Humidity, Temperature, Solar Radiation
6.	DG emissions (3 Locations)	1 at Ghogha, 1 at Hazira and 1 at Dahej	Once in a month	Particulate Matter, Sulphur Dioxide, Oxides of Nitrogen, Carbon Monoxide, Carbon Dioxide
7.	Marine Water Quality (5 Locations)	2 at Ghogha, 2 at Hazira and 1 at Dahej	Once in a month	Odor, Color, pH, Turbidity, TDS, TSS, Conductivity, DO, Particulate Organic Carbon, COD, BOD, Silica, Phosphate, Sulphate as SO_4^-, Nitrate as NO_3, Nitrite as NO_2, Sodium as Na, Potassium as K, Manganese,

Sr. No	Parameter	No. of locations	Frequency	Parameters
				Iron as Fe, Total Chromium, Hexavalent Chromium, Copper, Cadmium, Arsenic, Lead, Zinc, Mercury, Oil & grease, Floating Material (scum), Microbiological (MPN), Density
8.	Marine Water Quality for Biological Monitoring (5 locations)	2 at Ghogha, 2 at Hazira and 1 at Dahej	Once in a month	Chlorophyll-a, Pheophytin, Productivity (Net & Gross), Biomass, Relative Abundance, species composition and diversity of phytoplankton, Relative Abundance, species composition and diversity of zooplankton, Relative Abundance, species composition and diversity of benthic invertebrates (Meio, Micro and macro benthos), Particulate oxidizable organic carbon Secchi Depth
9.	Sediments Quality (5 Locations)	2 at Ghogha, 2 at Hazira and 1 at Dahej	Once in a month	Texture, Organic Matter, Inorganic Phosphate, Silica, Phosphate, Sulphate, Nitrite, Nitrate, Calcium, Magnesium, Sodium, Potassium, Aluminum, Copper, Chromium, Nickel, Zinc, Cadmium, Lead, Arsenic, Mercury.

1.4 Sample collection, preservation, storage and transportation to GEMI's Laboratory

Sampling of water and wastewater samples was carried out by GEMI's sampling protocol for Water and wastewater approved by the Government of Gujarat vide letter no. ENV-102013-299-E dated 24-04-2014 under the provision of the Water (Preservation and Control of Pollution) Act 1974. Soil sampling was conducted as per the Soil Sampling Manual by GEMI published in November 2016. Whereas, for the other components of the environment such as Ambient Air, Noise, & Marine Ecology, the guidelines/manuals brought out by CPCB were followed. The sampling was carried out by GEMI's trained manpower. The details of the environmental samples and their respective standards are summarized in **Table 3.**

Table 3: Details of Sample Collection and Analysis Method for Each Environmental Component

Sr. No.	Type of sample		Manual/ Standards and Protocols	Instruments
1.	Ambient Air	IS 5182 (Part 23): 2006	PM_{10}	Respirable Dust Sampler (RDS) Conforming to IS:5182 (Part-23): 2006
		IS:5182 (Part:24):2019	$PM_{2.5}$	Fine Particulate Sampler (FPS) Conforming to IS:5182 (Part-24): 2019
		IS:5182 (Part-2):2001	SO_x	Gaseous Attachment Conforming to IS:5182 (Part-2):2001
		IS:5182 (Part-6):2006	NO_x	Gaseous Attachment Conforming to IS:5182 (Part-6): 2006
		GEMI/SOP/AAQM/11; Issue no 01, Issue date 17.01.2019: 2019	Carbon Monoxide	Sensor-based Instrument
		IS 5182 (Part 11): 2006	Benzene	Low Flow Air Sampler Conforming to IS:5182 (Part-11): 2006
		IS 5182 (Part 11): 2006	VOC	Low Flow Air Sampler Conforming to IS:5182 (Part-11): 2006
		IS: 5182 (Part 17): 1979	Hydrocarbon	Aluminized plastic bags with on/off valve Conforming to IS 5182 (Part 17):1979
		IS: 5182 (Part 17): 1979	Non-Methane VOC	Aluminized plastic bags with on/off valve Conforming to IS 5182 (Part 17):1979
2.	DG Emissions		IS: 11255 and USEPA Method	Sensor-based Flue gas analyzer (Make: TESTO, Model 350) Stack Monitoring Kit
3.	Meteorological data		Installation of Automatic Weather Stations so as to get the periodic Meteorological data as per the requirement	Automatic Weather Stations

Sr. No.	Type of sample	Manual/ Standards and Protocols	Instruments
4.	Water (Drinking Water, Surface Water)	Sampling Protocol for Water & Wastewater approved by the Government of Gujarat vide letter no. ENV-102013-299-E dated 24-04-2014 under the provision of Water (Preservation and Control of Pollution) Act 1974.	For drinking water- Titration Apparatus, pH meter and conductivity meter Sample collection method: Grab sampling For marine water - Niskin Sampler
5.	Soil and Marine Sediments	Soil Sampling Manual by GEMI published in November 2016	For sediment sample collection –Van Veen grab sampler
6.	Noise	IS 9989:2014	Noise meter
7.	Marine Ecology	Technical guidance book – An introduction to aquatic Biomonitoring using Macro-invertebrates,2021 by CPCB	The sampling of the Benthic Invertebrates will be carried out with the help of D-frame nets, whereas the sampling of zooplankton and phytoplankton shall be carried out with the help of Plankton nets (60 micron and 20 micron).

1.5 Environmental Monitoring Plan for 13th October -12th November 2023

The Environmental monitoring was carried out for Ambient Air, Soil, Drinking water, Noise, Meteorology, DG Stack and Marine environment – Water, Sediment and Ecology. The detailed Environmental Monitoring Plan for 13th October -12th November 2023 is given in **Table 4**.

Table 4: Environmental Monitoring Plan for Dahej, Hazira and Ghogha for 13th October -12th November 2023

Sampling and Monitoring Team	Mr. Ashish Patat-Project Manager (Ghogha), Mr. Pritish Shrimali-Project Manager (Hazira), Mr. Anandgiri Gosai-Project Manager (Dahej)			
Task	**Actual Monitoring Dates**			
	Project sites			
Monitoring of Drinking water, Soil, Noise, Marine Water, Sediments and ecology	**Dahej**	**Hazira-1**	**Hazira-2**	**Ghogha**
Soil Monitoring	20-Oct-23	18-Oct-23	-	17-Oct-23
Drinking Water	20-Oct-23	18-Oct-23	-	17-Oct-23
Marine Water and Marine Sediments and Marine Ecology	20-Oct-23	18-Oct.-23	18-Oct-23	17-Oct-23
Noise Monitoring	2-Nov-23	06-Nov-23	10-Nov-23	17-Oct-23
Monitoring of DG Stack	11-Oct-23	13-Oct.-23	-	08-Nov-23
Monitoring of Ambient Air	16-Oct-23	16-Oct-23	16-Oct-23	16-Oct-23
	18-Oct-23	18-Oct-23	18-Oct-23	18-Oct-23
	22-Oct-23	22-Oct-23	22-Oct-23	22-Oct-23
	25-Oct-23	25-Oct-23	25-Oct-23	25-Oct-23
	01-Nov-23	01-Nov-23	01-Nov-23	01-Nov-23
	03-Nov-23	03-Nov-23	03-Nov-23	03-Nov-23
	06-Nov-23	05-Nov-23	05-Nov-23	05-Nov-23
	08-Nov-23	07-Nov-23	07-Nov-23	07-Nov-23
Meteorological Monitoring	13th October to 12th November 23			

Chapter 2. Results and Observations of Environmental monitoring at Dahej, Hazira & Ghogha

2.0 Monitoring of Various Environmental Components

Monitoring of various environment components was carried out at the locations listed in **Table 1** above. Details of each component have been mentioned as below

2.1 Ambient Air Monitoring

Air monitoring was carried out at four locations, 1 at Dahej, 2 at Hazira, and 1 at Ghogha. The monitoring cycle was twice a week for 24 hours sampling. Sampling for Benzene, Hydrocarbon, Non-methane VOC, and VOC was done once in a month. **Table 5** shows the results of ambient air monitoring.

Table 5: Result of Ambient Air Quality Monitoring

Sr. No.	Parameters	NAAQ Standards, 2009 (Industrial, Residential, Rural & Other Areas) for 24 hours	Location Code: (AM-D)							
			Sampling Date							
			16-10-2023	18-10-2023	22-10-2023	25-10-2023	01-11-2023	03-11-2023	06-11-2023	08-11-2023
1	PM_{10} (µg/m^3)	100 (µg/m^3)	71.39	157.72	153.79	167.81	170.2	226.47	191.85	189.41
2	$PM_{2.5}$ (µg/m^3)	60 (µg/m^3)	24.33	28.45	27.56	29.67	30.26	35.78	35.78	36.12
3	SO_2 (µg/m^3)	80 (µg/m^3)	6.58	7.74	21.41	73.4	56.69	9.18	46.21	45.29
4	NO_2 (µg/m^3)	80 (µg/m^3)	32.62	24.13	21.88	25.19	27.7	22.26	66.28	64.38
5	CO (µg/m^3)	2000 (µg/m^3)	920	980	1020	960	1040	980	1060	1030

Sr. No.	Parameters	NAAQ Standards, 2009 (Industrial, Residential, Rural & Other Areas) for 24 hours	Location Code: (AM-H1)							
			Sampling Date							
			16-10-2023	18-10-2023	22-10-2023	25-10-2023	01-11-2023	03-11-2023	05-11-2023	07-11-2023
1	PM_{10} (µg/m^3)	100 (µg/m^3)	172.32	253.53	194.75	299.38	226.09	237.86	167.90	238.90
2	$PM_{2.5}$ (µg/m^3)	60 (µg/m^3)	59.57	63.74	64.57	89.57	108.32	112.90	56.66	91.23
3	SO_2 (µg/m^3)	80 (µg/m^3)	9.29	7.61	7.02	33.80	13.17	42.66	32.56	37.75
4	NO_2 (µg/m^3)	80 (µg/m^3)	31.83	34.97	40.21	47.28	42.17	52.78	40.73	51.47
5	CO (µg/m^3)	2000 (µg/m^3)	470	500	530	490	530	480	520	500

Sr. No.	Parameters	NAAQ Standards, 2009 (Industrial, Residential, Rural& Other Areas) for 24 hours	Location Code: (AM-H2)							
			Sampling Date							
			16-10-2023	18-10-2023	22-10-2023	25-10-2023	01-11-2023	03-11-2023	05-11-2023	07-11-2023
1	PM_{10} (µg/m^3)	100 (µg/m^3)	171.57	255.18	193.69	298.11	227.34	236.57	168.12	239.36
2	$PM_{2.5}$ (µg/m^3)	60 (µg/m^3)	57.25	64.92	63.41	87.68	107.13	111.39	57.23	92.48
3	SO_2 (µg/m^3)	80 (µg/m^3)	9.72	6.86	6.58	34.28	14.48	43.21	33.82	36.39
4	NO_2 (µg/m^3)	80 (µg/m^3)	32.43	35.23	39.92	48.37	41.82	53.72	41.58	52.82
5	CO (µg/m^3)	2000 (µg/m^3)	480	520	510	500	520	490	530	510

Sr. No.	Parameters	NAAQ Standards, 2009 (Industrial, Residential, Rural& Other Areas) for 24 hours	Location Code: (AM-G)							
			Sampling Date							
			16-10-2023	18-10-2023	22-10-2023	25-10-2023	01-11-2023	03-11-2023	05-11-2023	07-11-2023
1	PM_{10} (µg/m^3)	100 (µg/m^3)	62.11	52.63	96.45	111.96	182.95	129.53	139.40	187.00
2	$PM_{2.5}$ (µg/m^3)	60 (µg/m^3)	26.64	17.48	38.30	24.98	38.29	97.40	27.06	36.21
3	SO_2 (µg/m^3)	80 (µg/m^3)	<5	<5	<5	<5	7.44	<5	<5	<5
4	NO_2 (µg/m^3)	80 (µg/m^3)	16.28	24.80	18.09	13.57	38.63	10.46	20.15	22.74
5	CO (µg/m^3)	2000 (µg/m^3)	520	510	530	490	500	480	490	470

Sr. No.	Parameters	NAAQ Standards, 2009 (Industrial, Residential, Rural & Other Areas) for 24 hours	Location Code: (AM-D)	Location Code: (AM-H1)	Location Code: (AM-H2)	Location Code: (AM-G)
			Sampling Date			
			16-10-2023	25-10-2023	26-10-2023	01-11-2023
1	Benzene (µg/m^3)	5 (µg/m^3)	<4.0	<4.0	<4.0	<4.0
2	Hydrocarbons (µg/m^3)	-	<4.0	<4.0	<4.0	<4.0
3	Non-methane VOC (µg/m^3)	-	<4.0	<4.0	<4.0	<4.0
4	VOC (µg/m^3)	-	<4.0	<4.0	<4.0	<4.0

Observations:

- The results of ambient air quality were compared with the National Ambient Air Quality Standards (NAAQS), 2009 specified by the Central Pollution Control Board (CPCB).
- Dahej: PM_{10} was found to be higher than the standard concentration of 100 µg/m^3 in all samples except for 16/10/23, whereas all other monitored parameters were determined to be within the standard range.
- Hazira:
  - The concentration of SO_2, NO_2, CO, Benzene, Hydrocarbons, Non-methane VOC, and VOC were observed within the standard limit.
  - PM_{10} was found to be higher than the standard concentration of 100 µg/m^3 in all samples.
  - For most of the samples collected during the month, the $PM_{2.5}$ was found to be higher than the standard concentration of 60 µg/m^3.
- Ghogha:
  - The concentration of SO_2, NO_2, CO, Benzene, Hydrocarbons, Non-methane VOC, and VOC were observed within the standard limit in all the samples.
  - PM_{10} was found to be higher than the standard concentration of 100 µg/m^3 in most of the samples.
  - $PM_{2.5}$ exceeded the standard limit only once and was within the standard limit in remaining samples.
- The high concentration of PM_{10} and $PM_{2.5}$ could be attributed to vehicular movement in the port area, surrounding road dust causing the dispersion of emitted particulate matter in the ambient air.

Preventive measures:

- Practice should be initiated by using a mask as a preventative measure, to avoid the health risk associated with the inhalation of dust particles to the person working in the port area.
- Water sprinkling on roads should be practiced to reduce dust suspension and its emission during vehicular movement.
- The primary port-related particulate matter sources are from the exhaust of engines of the power landside equipment, Seagoing marine vehicles, Ro-pax facilities operated at Hazira and Ghogha for loading and unloading vehicles, other industrial and commercial sources that burn fuel. This can be controlled by regular maintenance of the engines of the power landside equipment, Seagoing marine vehicles and Ro-pax facilities. Further, verification of Pollution Under Control (PUC) Certificate of vehicles loading into the Ro-pax ferry and within the port area can also help in reducing the emissions.

2.2 Drinking Water Monitoring

Drinking water sampling was carried out once a month at three locations i.e., 1 at Dahej, 1 at Hazira, and 1 at Ghogha. The analysis results were compared with the stipulated standards as per IS 10500:2012 and mentioned in **Table 6** below.

Table 6: Result of Drinking Water Quality Monitoring

Sr. No.	Parameters	Unit	Acceptable limit	Permissible limit	Location Code and Sampling Date		
			Standards IS 10500:2012		DW-D	DW-H	DW-G
					20-10-2023	18-10-2023	17-10-2023
1	pH	-	6.5-8.5	-	7.93	7.25	8.69
2	EC	µS/cm	-	-	221	189.4	205
3	TDS	mg/L	500	2000	116	96	104
4	Chloride	mg/L	250	1000	21.99	31.99	33.49
5	Total Hardness	mg/L	200	600	88	22	100
6	Calcium as Ca	mg/L	75	200	24.00	3.2	28
7	Magnesium as Mg	mg/L	30	100	6.72	3.36	7.2
8	Turbidity	NTU	1.00	5.00	BQL● (QL=0.5)	BQL● (QL=0.5)	BQL● (QL=0.5)
9	Fluoride as F	mg/L	1	1.5	0.395	0.673	BQL● (QL=0.3)
10	SO_4	mg/L	200	400	10.069	11.893	BQL● (QL=10)
11	Na	mg/L	60	-	11.76	39.70	28.28
12	K	mg/L	-	-	BQL● (QL=5)	BQL● (QL=5)	BQL● (QL=5)
13	NO_3	mg/L	45	-	3.523	7.162	6.829
14	NO_2	mg/L	-	-	BQL● (QL=0.1)	BQL● (QL=0.1)	BQL● (QL=0.1)
15	Odour	TON	Agreeable	Agreeable	1	1	1
16	Hg	mg/L	0.001	No Relaxation	BQL● (QL=0.0005)	BQL● (QL=0.0005)	BQL● (QL=0.0005)
17	Salinity	mg/L	-	-	0.11	0.09	0.10
18	Free Residual Cl	mg/L	0.2	1	BQL● (QL=2)	BQL● (QL=2)	BQL● (QL=2)
19	Pb	mg/L	0.01	-	BQL● (QL=0.002)	BQL● (QL=0.002)	BQL● (QL=0.002)
20	Cd	mg/L	0.003	No Relaxation	BQL● (QL=0.002)	BQL● (QL=0.002)	BQL● (QL=0.002)
21	Fe	mg/L	0.3	No Relaxation	BQL● (QL=0.1)	BQL● (QL=0.1)	BQL● (QL=0.1)
22	Total Cr	mg/L	0.05	No Relaxation	BQL● (QL=0.005)	BQL● (QL=0.005)	BQL● (QL=0.005)
23	Hexavalent Cr	mg/L	-	-	BQL● (QL=0.01)	BQL● (QL=0.01)	BQL● (QL=0.01)

Sr. No.	Parameters	Unit	Acceptable limit	Permissible limit	Location Code and Sampling Date		
			Standards IS 10500:2012		DW-D	DW-H	DW-G
					20-10-2023	18-10-2023	17-10-2023
24	Cu	mg/L	0.05	1.5	BQL● (QL=0.005)	BQL● (QL=0.005)	BQL● (QL=0.005)
25	Zn	mg/L	5.00	15.00	0.657	BQL● (QL=0.5)	BQL● (QL=0.5)
26	As	mg/L	0.01	0.05	BQL● (QL=0.005)	BQL● (QL=0.005)	BQL● (QL=0.005)
27	Color	Hazen	5.00	15.00	5	1	1
28	TSS	mg/L	-	-	116	BQL● (QL=2)	BQL● (QL=2)
29	Microbiological (MPN) (Total Coliforms)	CFU/ 100 ml	Shall not be detectable in any 100 ml sample		810	310	850
30	Mn	mg/L	0.1	0.3	BQL● (QL =0.04)	BQL● (QL =0.04)	BQL● (QL=0.04)

BQL – Below Quantification Limit QL– Quantification Limit

Observations:

- The samples were collected from the respective RO system at the monitored locations. The following were observed from the analysis of drinking water samples.
- Dahej:
  - The concentration of all the parameters was found to be within the standard acceptable limit except for total coliform content.
- Hazira:
  - All other physicochemical parameters were within the standard acceptable limit.
  - Total coliform content was detected in the sample.
- Ghogha:
  - pH of sample was found to be alkaline and little higher than the standard limit. It will not have any adverse health impact.
  - Total coliform content was detected in the sample.

Preventive measures:

- Total Coliforms were detected in samples of all locations which indicates the microbiological contamination. Therefore, the regular cleaning and maintenance of the RO system is recommended. The disinfection system should be replaced to prevent the contamination of water from coliform.

2.3 Noise level monitoring

Noise monitoring was conducted at all four locations, i.e., 1 at Dahej, 2 at Hazira and 1 at Ghogha. The Noise has been monitored once a month at all the locations for 24 hours. The results of the Noise monitoring are mentioned in **Table 7**. The results were compared with the prescribed limit of noise level as per the Noise Standards of Environment Protection Rules,2000 as given in **Table 8**.

Table 7: Result of Noise Monitoring

Sr. No.	Location Code	Oct-Nov 23						
		Date of Monitoring	Day Time			Night Time		
			Max.	Min.	Leq.	Max.	Min.	Leq.
1	N-D	02-Nov-23	70.9	49.8	60.0	53.7	48.2	51.4
2	N-H1	06-Nov-23	73.2	56.5	63.6	60.2	54.9	58.2
3	N-H2	10-Nov-23	72.2	57.4	58.2	61.3	54.7	56.4
4	N-G	17-Oct-23	50.6	32.6	45.5	41.7	30.5	38.4

Table 8: Ambient Air Quality Norms in Respect of Noise

Area Code	Type of area	Noise dB(A) Leq	
		Day time	Night time
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential area	55	45
D	Silent zone	50	40

Observations:

- Average Leq noise levels, for Day-time and Night-time at all locations, Dahej, Hazira, and Ghogha, were found below maximum permissible limits defined for “Industrial area”

2.4 Soil quality monitoring

Soil quality monitoring was carried out at all three locations, 1 at Dahej, 1 at Hazira and 1 at Ghogha once a month. **Table 9** shows the analysis results of soil quality.

Table 9: Result of Soil Quality Monitoring

Sr. No.	Parameters		Unit	Location Code & Date of Sampling		
				S-D	S-H	S-G
				20-10-2023	18-10-2023	17-10-2023
1	Organic Carbon		%	0.7	0.2	0.5
2	Total Organic Matter		%	1.2	7.24	0.87
3	Inorganic Phosphate (Av. Phosphorous)		kg/Ha	1.15	0.12	1.05
4	Particle size distribution & silt content	Sand %	-	16.25	50.24	28.24
5		Silt %	-	43.43	29.44	39.44
6		Clay %	-	40.31	20.32	32.32
7	Texture	Type of soil	-	Silty Clay	Sandy clay loam	Clay loam
8	pH		-	8.66	8.76	8.53
9	Conductivity		dSm/cm	0.241	2.99	0.27
10	SAR		meq/L	0.19	7.24	0.13
11	Water Holding Capacity		%	62	50	64
12	Al		mg/kg	643.74	1064.5	989.6
13	Cr		mg/kg	94.80	84.20	194.80
14	Ni		mg/kg	43.46	37.50	116.90
15	Cu		mg/kg	78.05	47.20	83.40
16	Zn		mg/kg	53.83	55.50	139.10
17	Cd		mg/kg	BQL● (QL=1)	BQL● (QL=1)	BQL● (QL=1)
18	Pb		mg/kg	2.89	0.80	4.70
19	As		mg/kg	2.89	3.00	11.50
20	Hg		mg/kg	BQL● (QL=0.005)	BQL● (QL=0.005)	BQL● (QL=0.005)

BQL – Below Quantification Limit QL- Quantification Limit

To classify the soil quality, the soil quality standards- “Soil fertility class by Soil Health card 2015” & “Standard limit EU 2002” were adopted and shown in **Table 10** below.

Table 10: Soil Quality Standard

Soil fertility class by Soil Health Card (SHC 2015)				
Sr. No.	**Parameter**	**Range & Interpretation of Result**		
1	**pH**	Acidic <6.5	Normal 6.5-8.2	Alkaline >8.2
2	**Electrical Conductivity (dSm/m)**	Normal <1	Medium 1-3	Harmful >3
3	**Available Phosphorus (kg/Hectare)**	Low < 28	Medium 28-56	High >56
4	**Organic Carbon (%)**	Low < 0.5	Medium 0.5-0.75	High > 0.75
5	**Zinc (mg/kg)**	Low < 0.5	Medium 0.5-1.0	High >1.0
6	**Copper (mg/kg)**	Low < 0.2	Medium 0.2-0.4	High >0.4
Standard limit EU 2002				
7	**Chromium (mg/kg)**	150		
8	**Lead (mg/kg)**	300		
9	**Cadmium (mg/kg)**	3.0		
10	**Nickel (mg/kg)**	75		

Observations:

- The texture of the soil of all locations was Silty Clay to Clay loam.
- The pH value in soil was found alkaline in nature at all three locations, Dahej, Hazira, and Ghogha.
- Electrical Conductivity at Dahej and Ghogha was found to be in the 'Normal' class; whereas, at Hazira, EC was observed to be 'Medium' category.
- Available phosphorus falls under the 'Low fertility' quality class at all three locations.
- The Organic carbon content in the soil was found in 'Medium Fertility' class at Dahej and Ghogha, while it was in 'Low fertility' class at the Hazira.
- The values of Zn and Cu were found higher and were in 'High fertility' class at all three locations.
- The heavy metals including Cr, Pb, Cd, and Ni were detected within permissible limits at Dahej and Hazira; whereas at Ghogha Cr and Ni were detected higher than the limit.
- The overall quality of soil at all three locations were found to have low essential nutrients, hence less suitable for plant growth.

Preventive measures:

- Soil fertility can be improved by incorporating cover crops that add organic matter to the soil, which leads to improved soil structure and promotes a healthy and fertile soil.

2.5 Marine Water, Sediment & Ecology Monitoring

Marine water, sediment, and ecology monitoring was carried out at five locations, 1 at Dahej, 2 at Hazira, and 2 at Ghogha. The results and observations are mentioned below.

2.5.1 Marine Water Quality Monitoring

The analysis results of the marine water are presented in **Table 11** below. The results of marine water quality were compared with the water quality criteria for the designated best use for the coastal water stipulated by the 'Environment (Protection) Act, 1986' shown in **Table 12.**

Table 11: Result of Marine Water Quality Monitoring

Sr. No.	Parameters	Unit	Location code & Date of Sampling				
			MA-D 20-10-2023	MA-H1 18-10-2023	MA-H2 18-10-2023	MA-G1 17-10-2023	MA-G2 17-10-2023
1	EC	µS/cm	8,930	44,300	44,600	36,800	37,300
2	DO	mg/L	6.8	6.2	6.5	6.6	8.3
3	pH	-	8.05	7.88	7.94	8.10	8.12
4	Color	Hazen	5	5	10	10	20
5	Odor	TON	1	1	1	1	1
6	Turbidity	NTU	796	544	598	483	620
7	TDS	mg/L	20,014	28,314	28,576	23,124	23,642
8	TSS	mg/L	712	508	558	418	586
9	Particulate Organic Carbon	mg/L	2.47	4.47	4.36	3.34	2.34
10	COD	mg/L	25.87	37.81	39.80	41.86	54.88
11	BOD	mg/L	3.88	4.73	4.98	5.23	6.86
12	Silica	mg/L	>5 (DL=5)	>5 (DL=5)	>5 (DL=5)	>5 (DL=5)	>5 (DL=5)
13	PO_4	mg/L	1.35	1.26	1.80	1.33	1.99
14	SO_4	mg/L	1603.4	2368.4	2291.5	1531.3	1654.70
15	NO_3	mg/L	5.46	4.76	4.45	6.70	6.306
16	NO_2	mg/L	BQL● (QL=0.1)	BQL● (QL=0.1)	BQL● (QL=0.1)	0.184	BQL● (QL=0.1)
17	Na	mg/L	5289	7685	8530	6809.00	7398
18	K	mg/L	145.12	230.10	233.00	201.00	211.10
19	Mn	mg/L	0.16	0.24	0.30	0.24	0.29

Sr. No.	Parameters	Unit	Location code & Date of Sampling				
			MA-D 20-10-2023	MA-H1 18-10-2023	MA-H2 18-10-2023	MA-G1 17-10-2023	MA-G2 17-10-2023
20	Fe	mg/L	2.56	5.68	5.70	3.52	3.13
21	Total Cr	mg/L	0.0072	0.018	0.0167	0.0095	0.0077
22	Hexavalent Cr	mg/L	BQL● (QL=0.01)	BQL● (QL=0.01)	BQL● (QL=0.01)	BQL● (QL=0.01)	BQL● (QL=0.01)
23	Cu	mg/L	0.01	0.046	0.022	0.014	0.016
24	Cd	mg/L	BQL● (QL=0.002)	BQL● (QL=0.002)	BQL● (QL=0.002)	BQL● (QL=0.002)	BQL● (QL=0.002)
25	As	mg/L	BQL● (QL=0.005)	BQL● (QL=0.005)	BQL● (QL=0.005)	BQL● (QL=0.005)	BQL● (QL=0.005)
26	Pb	mg/L	BQL● (QL=0.002)	BQL● (QL=0.002)	0.0021	BQL● (QL=0.002)	0.0027
27	Zn	mg/L	BQL● (QL=0.5)	BQL● (QL=0.5)	BQL● (QL=0.5)	BQL● (QL=0.5)	BQL● (QL=0.5)
28	Hg	mg/L	BQL● (QL=0.0005)	BQL● (QL=0.0005)	BQL● (QL=0.0005)	BQL● (QL=0.0005)	BQL● (QL=0.0005)
29	Oil & grease	mg/L	BQL● (QL=1)	BQL● (QL=1)	BQL● (QL=1)	BQL● (QL=1)	BQL● (QL=1)
30	Microbiological (MPN) (Total Coliforms)	100 ml/MPN	6	350	310	BQL (QL=2)	2
31	Density	kg/m^3	>1000 (QL=1000)	>1000 (QL=1000)	>1000 (QL=1000)	>1000 (QL=1000)	>1000 (QL=1000)
32	Floating material (Scum, Petroleum products)	-	ND	ND	ND	ND	ND

BQL – Below Quantification Limit, QL- Quantification Limit, ND- Not detected

Table 12: Water Quality Criteria: Primary Water Quality Criteria for Designated Best Uses for Coastal Waters [As per "The Environment (Protection) Act, 1986]

Parameters	SW-I	SW-II	SW-III	SW-IV	SW-V
pH	6.5 – 8.5	6.5 – 8.5	6.5 – 8.5	6.0 – 9.0	6.0 – 9.0
Dissolved oxygen (as O_2), mg/l, min	5 or 60% of saturation value, whichever is higher	4 or 50% of saturation value, whichever is higher	3 or 40% of saturation value, whichever is higher	3 or 40% of saturation value, whichever is higher	3 or 40% of saturation value, whichever is higher
Color & Odour	No noticeable color or offensive Odour	No noticeable color or offensive Odour	No noticeable color or offensive Odour	No noticeable color or offensive Odour	None in such concentrations that would impair any usages specifically assigned to this class
Floating Matters	No visible, obnoxious floating debris, oil slick, scum	Nothing obnoxious or detrimental for use purpose	No visible, obnoxious floating debris, oil slick, scum	10 mg/l max. (including Oil & grease & scum / petroleum products)	-
Oil & grease, mg/L max. (including petroleum products)	0.1	-	-		-
Suspended solids	None from sewage & industrial origin	-	-	-	-
Heavy metals • Mercury, mg/L(as Hg) • Lead, mg/L (as Pb) • Cadmium, mg/L (as Cd)	• 0.001 • 0.001 • 0.01	-	-	-	-

Parameters	SW-I	SW-II	SW-III	SW-IV	SW-V
Turbidity, NTUmax.	-	30	30	-	-
Fecal coliforms, MPN/100ml,max	-	100	500	500	500
BOD, mg/L, 3 days at 27°C, max	-	3	-	5	-
Dissolved Iron, mg/L max (as Fe)	-	-	0.5	-	-
Dissolved Manganese, mg/L max (as Mn)	-	-	0.5	-	-
Sludge deposits,solid refuse, floating solids, oil & grease,scum	-	-	-	-	None except for such small amount that may result from discharge of appropriately treated sewage & or industrial waste

SW-I: Salt Pans, Shell fishing, mariculture and ecologically sensitive zone.
SW-II: Bathing, Contact Water Sports and Commercial Fishing
SW-III: Industrial Cooling, Recreation (non-contact) and Esthetics
SW-IV: Harbor Waters
SW-V: Navigation and Controlled Waste Disposal

2.5.2 Marine sediment quality monitoring

The quality of the Marine sediment samples collected from Dahej, Hazira & Ghogha from 13th October -12th November 2023 has been summarized in **Table 13**.

Table 13: Result of Marine Sediment Quality Monitoring

Sr. No.	Parameters	Unit	Location Code and Sampling Date				
			MA-D	MA-H1	MA-H2	MA-G1	MA-G2
			20-10-2023	18-10-2023	18-10-2023	17-10-2023	17-10-2023
1	Texture	-	Loam	Loam	Silt loam	Silt loam	Clay
2	Organic Matter	%	0.7	0.54	1.47	1.3	0.03
3	Inorganic Phosphate (Av. Phosphorus)	kg/Ha	1.66	1.46	3.47	1.74	0.87
4	Silica	mg/kg	614.03	553.88	557.61	514.29	563.61
5	Phosphate (Total Phosphorous)	mg/kg	157.01	218.87	195.53	101.71	185.93
6	SO_4	mg/kg	41.96	78.92	92.61	70.99	73.85
7	NO_2	mg/kg	0.16	0.29	0.25	0.10	0.32
8	NO_3	mg/kg	5.23	6.63	8.14	8.59	4.56
9	Ca	mg/kg	2200	2500	2500	2800	3500
10	Mg	mg/kg	1708	2379	2867	2074	1586
11	Na	mg/kg	5777	8545	10119	8096	5477
12	K	mg/kg	2383	2071	3381	3490	9653
13	Al	mg/kg	612.542	1070.8	553.935	1079.1	991.7
14	Cr	mg/kg	98.462	96.7	107.171	101.1	195
15	Ni	mg/kg	38.546	45.8	42.648	43.5	116.5
16	Zn	mg/kg	72.90	62.00	63.62	69.30	138.40
17	Cd	mg/kg	BQL● (QL=1)	BQL● (QL=1)	BQL● (QL=1)	BQL● (QL=1)	BQL● (QL=1)
18	Pb	mg/kg	3.9	1.0	2.8	1.7	4.2
19	As	mg/kg	3.4	3.1	3.1	3.6	11.9
20	Hg	mg/kg	BQL● (QL=0.005)	BQL● (QL=0.005)	BQL● (QL=0.005)	BQL● (QL=0.005)	BQL● (QL=0.005)
21	Cu	mg/kg	70.40	67.60	66.62	52.00	83.6

BQL – Below Quantification Limit QL- Quantification Limit

Observations:

The marine sediment quality at Dahej, Hazira, and Ghogha was compared based on the obtained results, and following were observed.

- Organic matter in sediment consists of carbon and nutrients in the form of carbohydrates, proteins, fats, and nucleic acids. Sediment organic matter is derived from plant and animal detritus, bacteria, or plankton formed in situ, or derived from natural and anthropogenic sources in catchments. Organic matter was found to be 0.7% at Dahej, 0.54 to 1.47% at Hazira, and 0.03 to 1.3 % at Ghogha.
- Inorganic phosphate was found to be 1.66 kg/Ha at Dahej, 1.46 to 3.47 kg/Ha at Hazira, and 0.87 to 1.74 kg/Ha at Ghogha. The capacity of sediment to retain or release phosphorus is one of the important factors, which influence the concentration of inorganic/organic phosphorus in the overlying waters (Saravanakumar, Rajkumar, Serebiah, & Thivakaran, 2008).
- Sediments ranged in texture from Loam at MA-D, MA-H1 and Silt loam at MA-H2, MA-G1, and Clay at MA-G2.
- The concentration of Sulphate was found to be 41.96 mg/kg at Dahej, 78.92 to 92.61 mg/kg at Hazira, and 70.99 to 73.85 mg/kg at Ghogha. Sulphate concentrations in marine sediment can vary naturally based on geological and hydrological factors.
- Nitrite concentration was found 0.16 mg/kg at Dahej, 0.25 to 0.29 mg/kg at Hazira, and 0.10 to 0.32 mg/kg at Ghogha.
- Nitrate concentration was found to be 5.23 mg/kg at Dahej, 6.63 to 8.14 mg/kg at Hazira, and 4.56 to 8.59 mg/kg at Ghogha.
- Ca was found to be 2200 mg/kg at Dahej, 2500 mg/kg at Hazira, and 2800 to 3500 mg/kg at Ghogha. The source of Ca accumulation in marine sediment may be because of its naturally occurring element and its concentration can vary widely local geological, hydrological conditions and environmental factors. It depends on various factors, including the composition of the underlying rocks, and the presence of calcareous organisms like coral reefs.
- Mg was observed to be 1708 mg/kg at Dahej, 2379 to 2867 mg/kg at Hazira and 1586 to 2074 mg/kg at Ghogha. Mg values varied in the range from 1586 to 2867 mg/kg. Magnesium is an essential component of marine sediments and plays a significant role in marine ecosystem dynamics. The concentration of magnesium in marine sediments can depend on various factors, including the composition of the underlying rocks, sediment type, and local hydrological conditions.

- The values for Sodium in marine sediment were found to be 5777 mg/kg at Dahej, 8545 to 10119 mg/kg at Hazira, and 5477 to 8096 mg/kg at Ghogha. Sodium concentrations in marine sediments are often correlated with salinity levels. It is an essential component of marine ecosystems.
- The value for Potassium was found to be 2383 mg/kg at Dahej, 2071 to 3381 mg/kg at Hazira, and 3490 to 9653 mg/kg at Ghogha. Potassium is an essential nutrient for plants and organisms and contributes to various biological processes. The concentration of potassium in marine soils can depend on factors such as the composition of parent materials, sediment types, weathering processes, and local hydrological conditions.
- The Silica in marine sediment was found to be 614.03 mg/kg at Dahej, 553.88 to 557.61 mg/kg at Hazira, and 514.29 to 563.61 mg/kg at Ghogha. Its presence in marine sediments can be attributed to both natural geological processes and biological contributions such as mineral weathering, biogenic silica, aquatic plants, and oceanographic processes.
- The Total phosphorus concentration was found to be 157.01 mg/kg at Dahej, 195.53 to 218.87 mg/kg at Hazira, and 101.71 to 185.93 mg/kg at Ghogha. Phosphorus is an essential nutrient for marine ecosystems, playing a crucial role in biological processes. Its presence in marine sediments can have significant implications for nutrient cycling and ecosystem health. It can accumulate on the seafloor through land runoff, natural weathering, decomposition of organic matter, local geology etc.
- The sediment quality for the trace metals concentration was compared with respect to the (US Environmental Protection Agency, 1977), (Saravanakumar, Rajkumar, Serebiah, & Thivakaran, 2008), (Augustynowicz, et al., 2013), (Sanyal, Anilava, & Subrata, 2017) (Tokatli, 2017), (Perin, Bonardi, & Scotto, 1997), (Onjefu & Kwaambwa, 2020), (B., X., X., & S., 2018), (Pazi, 2011), as shown in **Table 14**.

Table 14: Sediment Quality Guidelines (SQG) of the US Environmental Protection Agency (EPA) 1977

Metals	Sediment quality (mg/kg)		
	Not polluted	Moderately polluted	Heavily polluted
As	<3	3-8	>8
Cu	<25	25-50	>50
Cr	<25	25-75	>75
Ni	<20	20-50	>50
Pb	<40	40-60	>60
Zn	<90	90-200	>200
Al	ND	ND	ND

Metals	Sediment quality (mg/kg)		
	Not polluted	Moderately polluted	Heavily polluted
Cd	-	<6	>6
ND- Not detected			

- As per the comparison of the metals to this guideline, a variation in the concentration of the metals was found. The concentration of Pb and Zn was found in the 'Not polluted' quality class except Zn at MA-G2 whereas, As, Ni, Cu, and Cr were in the 'Moderately polluted' to 'Heavily polluted' quality class. Sediments are highly dynamic, constantly being deposited and carried away by water currents (Labenua, et al., 2023). The Possible reasons for the higher concentration of some heavy metals may be attributed to the high sedimentation rate and due to various natural and anthropogenic factors.

2.5.3 Marine Ecological Monitoring

The various parameters monitored for Marine ecological monitoring are mentioned in **Table 15** and **Table 16** as follows:

Table 15: Result of Marine ecological monitoring for Biomass, NPP, GPP, Pheophytin, Chlorophyll-a, Secchi depth & Particulate Oxidizable Organic Carbon

Location Code	Sampling Date	Biomass	Net Primary Productivity (NPP)	Gross Primary Productivity (GPP)	Pheophytin	Chlorophyll-a	Secchi Depth	Particulate Oxidizable Organic Carbon
		mg/L	mg/L/Hr	mg/L/Hr	mg/m^3	mg/m^3	meter	mg/L
MA-D	20-10-2023	220	-	-	BQL	2.59	0.056	2.47
MA-H1	18-10-2023	190	-	-	BQL	0.94	0.058	4.47
MA-H2	18-10-2023	220	-	-	BQL	2.54	0.066	4.36
MA-G1	17-10-2023	242	BQL	BQL	BQL	BQL	0.048	3.34
MA-G2	17-10-2023	222	BQL	BQL	BQL	0.79	0.061	2.34

BQL – Below Quantification Limit

Table 16: Result of Marine ecological monitoring for Benthic macroinvertebrates, phytoplankton and zooplankton

Location Code	Sampling Date	Benthic macroinvertebrates (Counts/L)		Phytoplankton (Counts/L)		Zooplankton (Counts/L)	
		Observation	Individual count	Genera	Individual count	Observation	Individual count
MA-D	20-10-2023	Nil	Nil	Nil	Nil	Nil	Nil
MA-H1	18-10-2023	–	–	Nil	Nil	Nil	Nil
MA-H2	18-10-2023	–	–	Nil	Nil	Nil	Nil
MA-G1	17-10-2023	Mollusca - Bithynidae	7	Nil	Nil	Nil	Nil
MA-G2	17-10-2023	–	–	Nil	Nil	Nil	Nil

Observations and Interpretation:

- Biomass content ranged from 190 to 242 mg/L; this is an indication of a low to moderate population of organisms in the sampling stations. This could be due to the presence of a mixed population including chlorophyll-containing organisms as well as chlorophyll-lacking organisms. This implies to the lower Secchi depth values.
- Phytoplankton and zooplankton count were nil; The main growth factors behind algae include mainly phosphorus and nitrogen with the presence of some other micronutrients such as iron and silicon. The phosphorus concentration was around 1 mg/L, whereas the nitrate concentrations ranged from 4.45 to 6.7 mg/L. These values are likely to show nutrient-limited environments in the water that are insufficient for promoting the growth of phytoplankton. (Elser, et al., 1990)
- When there is an availability of adequate light and favorable temperature, nutrient unavailability can result in limited or no growth of phytoplankton species. (Hecky, R. E., & P., 1988)
- Rapid fluctuations in the level of salinity are likely to retard the growth of stenohaline plankters (The Oceans, Their Physics, Chemistry, and General Biology.). Hence, the resultant productivity levels were found to be almost negligible.
- Low benthic macroinvertebrate count: Fluctuations in salinity levels are also responsible for limited or no growth of benthic macroinvertebrate species.

2.6 Meteorological Monitoring

To determine the prevailing micro-meteorological conditions at the project site the Automatic Weather Monitoring Stations (AWS) have been installed at the sites the sites of Dahej, Hazira, and Ghogha at 10 m above the ground.

The summary of hourly meteorological observations recorded at the observatory, Dahej, Hazira, and Ghogha for 13th October- 12th November 2023 for the significant parameters has been mentioned in **Table 17.**

Table 17: Result of Meteorological Monitoring

Sr. No.	Location	Month	Wind Direction	Wind Speed (m/sec)			Rain mm/hr	Relative Humidity (%)			Temperature (°C)			Solar Radiation W/m^2
				Mean	Max	Min	(Avg.)	Mean	Max	Min	Mean	Max	Min	(Avg.)
1	M-D	October-November 2023	From South-East	1.14	3.82	0.14	0	44.61	48.26	40.94	30.52	31.34	29.72	82.52
2	M-H		From east-south-east	2.15	5.36	0.76	0	53.49	58.67	48.36	31.98	32.8	31.21	35.85
3	M-G		From North	1.12	3.91	0.17	0	56.57	60.04	52.93	29.76	30.62	28.93	77.77

Observations:

The monthly average of maximum and minimum daily observed values summarized in **Table 17** have been discussed as follows.

- **Temperature**

  Dahej: The ambient temperature varied in the range of 29.72-31.34°C with an average temperature of 30.52 °C.

  Hazira: The ambient temperature varied in the range of 31.21-32.8°C with an average temperature of 31.98°C.

  Ghogha: The ambient temperature varied in the range of 28.93-30.62°C with an average temperature of 29.76°C.

- **Relative Humidity**

  Dahej: The relative humidity was recorded in the range of 40.94-48.26% with an average humidity of 44.61%.

  Hazira: The relative humidity was recorded in the range of 48.36-58.67%, with an average humidity of 53.49%.

  Ghogha: The relative humidity was recorded in the range of 52.93-60.04%, with an average humidity of 56.57%.

- **Rainfall**

  No rainfall was recorded during the period at Dahej, Hazira and Ghogha.

- **Wind Speed**

  Wind speed and direction play a significant role in transporting the pollutants and thus decide the air quality.

  The wind speed at Dahej, Hazira and Ghogha ranged from 0.14-3.82 m/s, 0.76-5.36 m/s and 0.17-3.91 m/s, respectively.

- **Solar Radiation**

  The average solar radiation at Dahej, Hazira, and Ghogha was 82.52 W/m^2, 35.85 W/m^2 and 77.77 W/m^2 respectively.

- **Wind rose diagram**

  The wind-rose diagram for 13th October-12th November 2023 has been drawn based on hourly wind speed and direction data. This wind rose reveals that the prevailing winds in Dahej, Hazira and Ghogha predominantly blow from a South-East (SE), East-South-East (ESE), and North (N) direction, respectively.

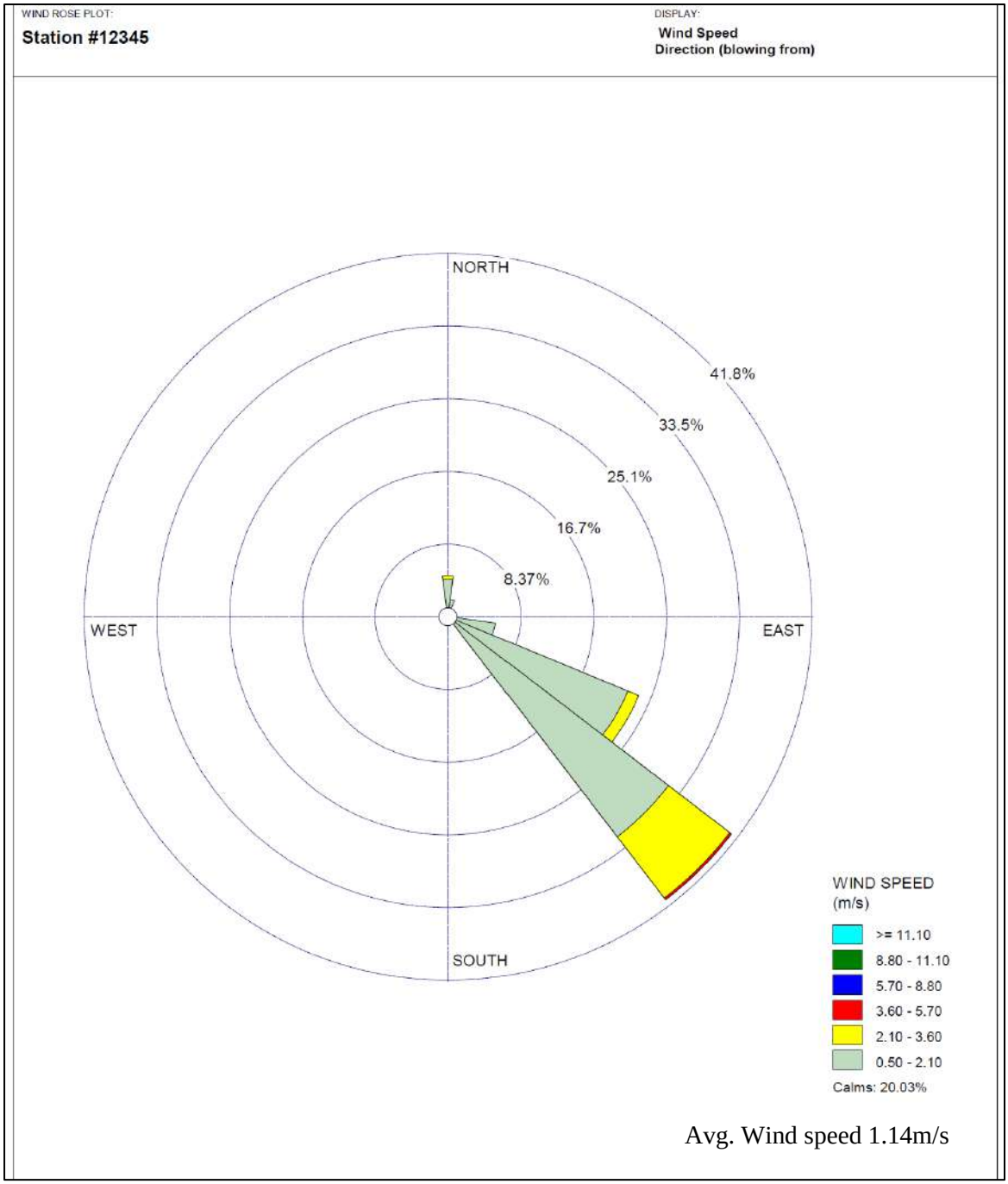

Fig. 5: Windrose diagram of Dahej

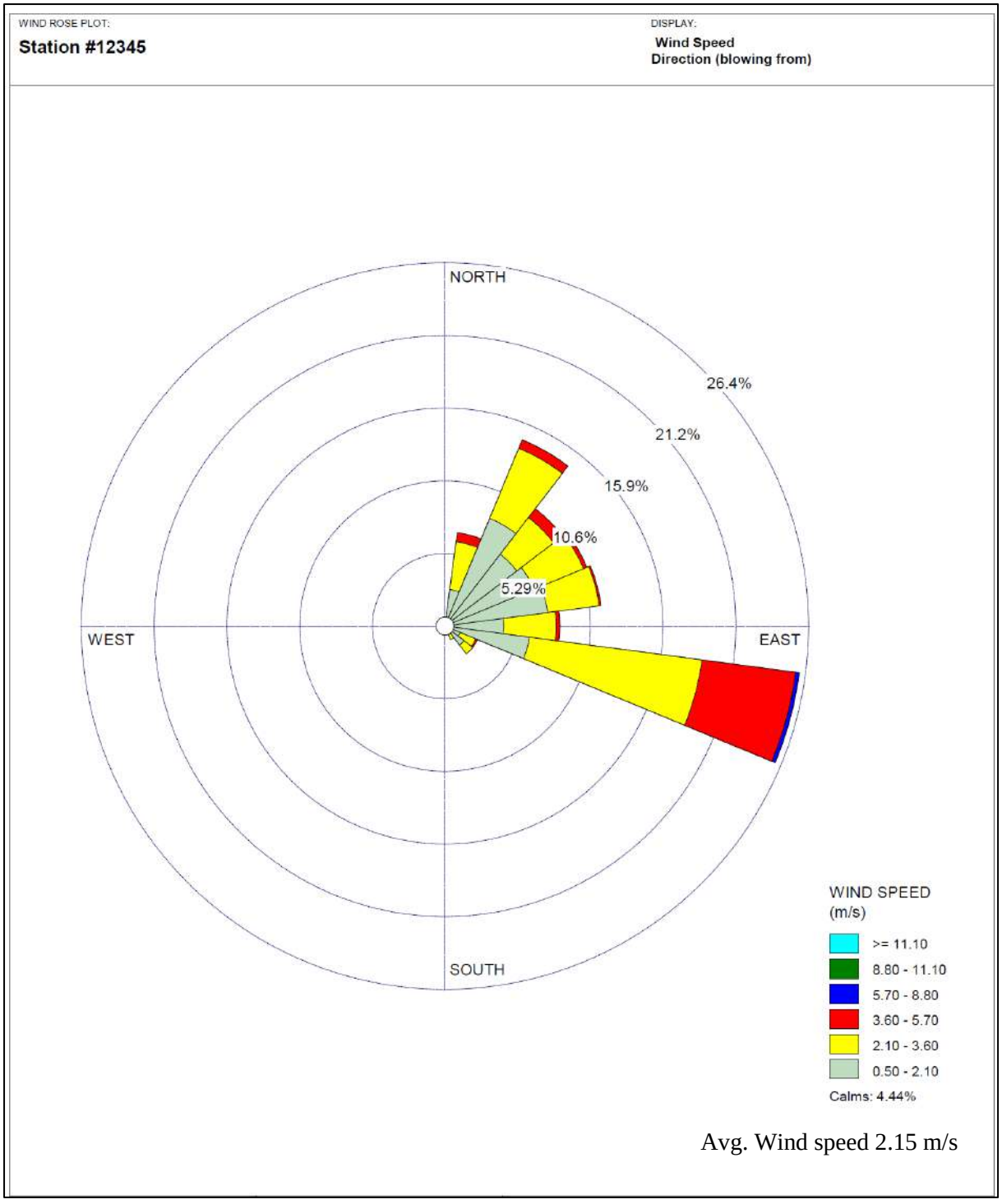

Fig. 6: Windrose diagram of Hazira

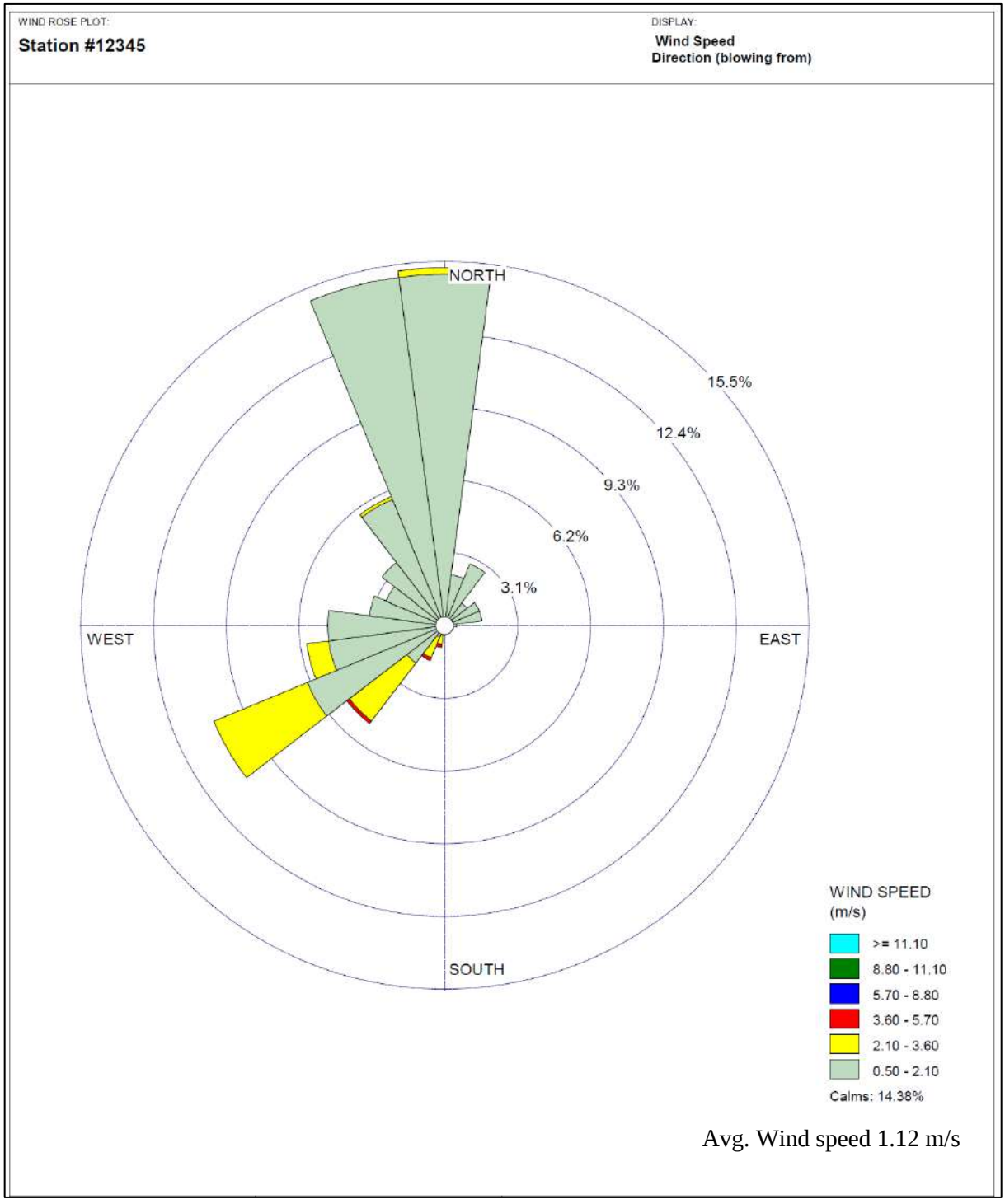

Fig. 7: Windrose diagram of Ghogha

2.7 Monitoring of DG Stack Emissions

DG sets at the Deendayal Port Authority (DPA) are generally utilized as a secondary power source. The sampling and monitoring of the DG stack emissions was carried out at Dahej, Hazira and Ghogha. The monitoring cycle was once a month. Sampling details of the locations are mentioned in **Table 18**.

Table 18: Result of DG Stack Emissions

Sr. No.	Parameters	Unit	DG Set standards	Location Code (DG-D)	Location Code (DG-H)	Location Code (DG-G)
				Sampling Date		
				11-10-2023	13-10-2023	08-11-2023
1.	Suspended Particulate Matter (SPM)	mg/Nm^3	150	126	132	137
2.	SO_2	PPM	100	N.D.	N.D.	N.D.
3.	NOx	PPM	50	47.8	49.3	49.5
4.	CO	%	-	0.0091	0.0095	0.0089
5.	CO_2	%	-	1.45	1.42	1.41

N.D. – Not Detectable

Observations:

The results of DG stack emissions for Hazira, Dahej and Ghogha are compared with the DG Set standards and found within the prescribed limit for SPM, SO_2 and NOx.

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