

Bhagwat Swaroop Sharma

From: Bhagwat Swaroop Sharma
Sent: Tuesday, May 30, 2023 8:06 PM
To: ecompliance-guj@gov.in; iro.gandhingr-mefcc@gov.in
Cc: ec-rdw.cpcb@gov.in; ro-gpcb-kute@gujarat.gov.in; ms-gpcb@gujarat.gov.in; mefcc.ia3@gmail.com; monitoring-ec@nic.in; direnv@gujarat.gov.in; Snehal Jariwala
Subject: Half Yearly EC Compliance Report Submission - APSEZ, Mundra - SPM & Pipeline for COT Oct.'22 to March'23)
Attachments: EC Compliance Report_SPM-2004_Oct'22 to Mar'23.pdf



Ports and
Logistics

APSEZL/EnvCell/2023-24/007

To

The Inspector General of Forest / Scientist C,
Integrated Regional Office (IRO),
Ministry of Environment, Forest and Climate Change,
Aranya Bhawan, A Wing, Room No. 409,
Near CH 3 Circle, Sector – 10A,
Gandhinagar – 382007.
E-mail: ecompliance-guj@gov.in, iro.gandhingr-mefcc@gov.in

Sub : Half yearly Compliance report of Environment Clearance of "Single Point Terminal (COT) and connecting pipes at Mundra Port, District Kachchh Limited"

Ref : Environment clearance granted to M/s Adani Ports & SEZ Ltd. vide letter bearing no. J-16011/30/2003-IA-III.

Dear Sir,

Please refer to the above cited reference for the said subject matter. In connection to copy of the compliance report for the Environmental and CRZ Clearance for the period 2023 is being submitted through soft copy (e-mail communication).

Kindly consider above submission and acknowledge.

Thank you,

Yours Faithfully,

For, **M/s Adani Ports and Special Economic Zone Limited**

Bhagwat Swaroop Sharma
Head - Environment

Thanks & Regards,

Bhagwat Swaroop Sharma
Sr. Manager - Environment
Mundra & Tuna port

Adani Ports & Special Economic Zone Ltd.

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Goodness

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Ports and
Logistics

APSEZL/EnvCell/2023-24/007

Date: 25.05.2023

To

The Inspector General of Forest / Scientist C,

Integrated Regional Office (IRO),

Ministry of Environment, Forest and Climate Change,

Aranya Bhawan, A Wing, Room No. 409,

Near CH 3 Circle, Sector – 10A,

Gandhinagar – 382007.

E-mail: ecompliance-guj@gov.in, iro.gandhinagr-mefcc@gov.in

Sub : Half yearly Compliance report of Environment Clearance of "Single Point Mooring (SPM), Crude Oil Terminal (COT) and connecting pipes at Mundra Port, District Kachchh by M/s. Adani Ports & SEZ Limited"

Ref : Environment clearance granted to M/s Adani Ports & SEZ Ltd. vide letter dated 21st July, 2004 bearing no. J-16011/30/2003-IA-III.

Dear Sir,

Please refer to the above cited reference for the said subject matter. In connection to the same, it is to state that copy of the compliance report for the Environmental and CRZ Clearance for the period of October 2022 to March 2023 is being submitted through soft copy (e-mail communication).

Kindly consider above submission and acknowledge.

Thank you,

Yours Faithfully,

For, **M/s Adani Ports and Special Economic Zone Limited**

Bhagwat Swaroop Sharma

Head - Environment

Mundra & Tuna Port

Encl: As above

Copy to:

- 1) The Director (IA Division), Ministry of Environment, Forests & Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110003.
- 2) The Zonal Officer, Regional Office, CPCB – Western Region, Parivesh Bhawan, Opp. VMC Ward Office No. 10, Subhanpura, Vadodara – 390023.
- 3) The Member Secretary, GPCB – Head Office, Paryavaran Bhavan, Sector 10 A, Gandhi Nagar – 382010.
- 4) The Director, Forests & Environment Department, Block – 14, 8th floor, Sachivalaya, Gandhi Nagar – 382010.
- 5) The Regional Officer, Regional Office GPCB (Kutch-East), Gandhidham – 370201.

Adani Ports and Special Economic Zone Ltd

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Gujarat, India

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Registered Office: Adani Corporate House, Shantigram, Nr. Vaishno Devi Circle, S.G. Highway, Khodiyar, Ahmedabad – 382421, Gujarat, India

Environmental Clearance Compliance Report of



SPM, Crude Oil Terminal and
Connecting Pipes

at
Mundra Port,
Dist. Kutch, Gujarat
of

Adani Ports and SEZ Limited

Period:
October-2022 to March-2023

	Adani Ports and Special Economic Zone Limited, Mundra.	From : Oct'22 To : Mar'23
Status of the conditions stipulated in Environment Clearance under CRZ notification		

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**EC & CRZ
Clearance
Compliance
Report**

	Adani Ports and Special Economic Zone Limited, Mundra.	From : Oct'22 To : Mar'23
Status of the conditions stipulated in Environment Clearance under CRZ notification		

- Chronology of company name change from **M/s. Gujarat Adani Port Limited** to **M/s. Adani Ports and Special Economic Zone Ltd.** was submitted along with half yearly EC Compliance report for the period Apr'21 to Sep'21.

	Adani Ports and Special Economic Zone Limited, Mundra	From : Oct'22 To : Mar'23
Status of the conditions stipulated in Environment Clearance under CRZ notification		

Half yearly Compliance report of Environment and CRZ Clearance of "Single Point Mooring (SPM), Crude Oil Terminal (COT) and connecting pipes at Mundra Port, District Kutch issued by MoEF vide letter no. J-16011/30/2003-IA.III dated 21st July 2004.

Sr. No.	Conditions	Compliance Status as on 31-03-2023
A. Specific Condition		
1.	<p>Mangrove afforestation in 25 ha of area, suitably identified in consultation with State Forest Department. The GAPL shall bear the cost of the said land as well as the cost of the plantation of mangroves and its sustenance and implant within 6 months from the date of clearance of this letter. Further, it shall be ensured that mangroves in the vicinity of the salt works are not affected due to the project.</p>	<p>Complied.</p> <p>25 hectare of mangrove plantation with a cost of 10 Lakh is already completed near railway yard in consultation with Dr. Maity, Mangrove consultant of India.</p> <p>There are no salt works within the project area.</p> <p>It may be noted that to enhance the marine biodiversity, till date APSEZ has carried out mangrove afforestation in 3890 ha. Area across the coast of Gujarat. Total expenditure for the same till date is INR 1070.8 lakh.</p> <p>Details on Mangroves afforestation & Green belt development carried out by APSEZ till date is annexed as Annexure – 1.</p> <p>Other than this Adani Foundation – CSR Arm of Adani Group at Mundra-Kutch has initiated multi-species plantation of mangroves in Luni village in association with M/s. GUIDE, Gujarat. During 2018-2019 (Phase-I) multi-species mangrove plantation was carried out in 10 ha, during Phase-II (2019-2020) it was 02 ha and during Phase III (2020-2021) it is 01 ha. During FY 2021-22, 03 ha area coastal stretches have been planted with species. During current FY 2022-23, 04 Hectar plantation has been planted with various species. Total 20 Ha. multi-species mangrove plantation has been carried out till March-23 association with M/s. GUIDE, Gujarat.</p> <p>Please refer attached Annexure – 2 for CSR activity report carried out by Adani Foundation.</p>
2.	<p>In addition to the mangrove plantation, GAPL should also take up massive green belt developments in 30 acres of land in and around the project in consultation with the Forest Department. Detailed plan indicating the area identified for the</p>	<p>Complied.</p> <p>During the course of development of the project, green belt was developed in 6.18 Hectares of land. Total 7607 trees were planted with the density of 1230 trees per hectare within port premises at a cost of Rs. 25.00 Lakh.</p> <p>This plantation was done in consultation with Gujarat Ecological Commission (as they are one of the authorized agencies of Dept. of</p>

	Adani Ports and Special Economic Zone Limited, Mundra	From : Oct'22 To : Mar'23
Status of the conditions stipulated in Environment Clearance under CRZ notification		

Sr. No.	Conditions	Compliance Status as on 31-03-2023
	mangrove plantation as indicated at (i) above and for green belt development along with the financial outlay shall be provided to this ministry within 6 months from the date of receipt of this letter.	<p>Forest & Env. Dept., Govt. of Gujarat).</p> <p>In addition to this, various activities on green belt development and mangrove plantation are being carried out on regular basis by horticulture department. The spent budget of Horticulture Department for the period of financial year 2022-23 is INR 979 lacs. Out of which, Approx. INR 956 lakh are spent during the current FY 2022-23.</p> <p>It may be noted that, APSEZ has developed 457.99 ha. area as greenbelt with plantation of more than 9.06 Lacs saplings within the APSEZ area. Details on mangroves afforestation & Green belt development carried out by APSEZ till date is annexed as Annexure - 1.</p>
3.	No dredging activity shall be carried out.	<p>Complied.</p> <p>Construction activities are completed & project is in operation stage. SPM is approximately 8.6 km inside the open sea from the shore where 30 m of draft is naturally available. Hence no dredging is required.</p>
4.	No ground water should be tapped at the project site / within CRZ area.	<p>Complied.</p> <p>No ground water is tapped at the project site. Entire water requirement is fulfilled through APSEZ Desal Water and GWIL.</p>
5.	Adequate facilities as listed in National Oil spill Disaster Contingency Plan for the Mundra Port which includes firefighting equipment of 1200 cum/hr. spray capacity with 2 monitor fitted with the dolphin 2, 3, 4 and 5 oil spill dispersant foam liquid etc. should be maintained and put into operation immediately in case of oil spills.	<p>Complied.</p> <p>Oil spill contingency plan is in place to handle Tier 1 level oil spills considering different accident scenarios, and the vulnerable areas are identified and mitigation plan is prepared.</p> <p>Oil spill contingency response plan is being updated on regular basis and the same was last updated on 30.07.2022 is in place and implemented. The Oil spill contingency response plan was submitted along with EC Compliance report for the period Apr'22 to Sep'22.</p> <p>For responding to oil spill, the Indian Coast Guard has developed the National Oil Spill Disaster Contingency Plan NOSDCP which has the approval of the Committee of Secretaries and has been in operation since 1996. Oil Spill Contingency Response Plan (OSCRP) prepared by APSEZ is in accordance with the NOSDCP.</p> <p>Latest Regional Level Pollution Response exercise "SWACHCHH SAMUDRA-NW 2022" was carried out by Indian Coast Guard on 12th</p>

Status of the conditions stipulated in Environment Clearance under CRZ notification

Sr. No.	Conditions	Compliance Status as on 31-03-2023																						
		<p>April, 2022 at Vadinar, Gujarat. All participants from various Oil Handling Agencies and Stakeholders (ICG, RELIANCE, ESBTL, OOCL, APSEZ, BORL, VOTL (NAYARA) were participated in this exercise. Details of the same were submitted along with EC Compliance report for the period Apr'22 to Sep'22.</p> <p>Based on the oil spill modeling study, it has been observed that crude oil spill of 700 tons (Tier-I) will spread over an area having radius of around 400 m within 4hr. APSEZ already has facilities for combating a Tier-1 spill. Shoreline Resources available with APSEZ, for deployment during shoreline cleanup/ emergent situation:</p> <table><tr><th>Item</th><th>Quantity</th></tr><tr><td>Oil Spill Dispersants</td><td>5000 ltr.</td></tr><tr><td>Absorbent pads</td><td>2000 Nos.</td></tr><tr><td>Portable dispersant storage tank: 1000 ltr. Capacity</td><td>1 no.</td></tr><tr><td>Portable pumps</td><td>2 nos.</td></tr><tr><td>Oil Containment Boom-Length 2000 metres, Height -1500 mm, Draft-900mm, Free Board-600mm</td><td>2000 m</td></tr><tr><td>Skimmer-KOMARA 15 Duplex Skimmer System with floating IMP 6 Pump.</td><td>4 Nos.</td></tr><tr><td>12.5T Flexible Floating Storage Tank (PUA).</td><td>3 Nos.</td></tr><tr><td>Lamor Minimax 12 m³ skimmer</td><td>2 sets</td></tr><tr><td>Lamor Side Collector system (Recovery Capacity 123 m³/ hr)</td><td>2 Nos. 2 sets</td></tr><tr><td>Canadyne Fence Boom (Reel model 7296/8496 with Power Pack, Towing bridles and Tow lines - 235 meter</td><td>1 No.</td></tr></table> <ul style="list-style-type: none">• 10 Tugs are fitted with Oil Spill Lamor Side Dispersant boom and proportionate pump to mix OSD and Sea water as required.• 10 Dolphin tugs are fitted with Oil Spill Dispersant boom and proportionate pump to mix OSD and Sea water as required. The tugs are fitted with a fire curtain and remote-controlled fire monitors.• Dolphin 11 has firefighting system of 1200 m³/hr. along with 20 ton lifting "A" frame and diving support facility.• The equipment are being kept in working condition. Routine inspection, maintenance and testing is performed as per the stipulated requirements.• Detail of resource available at APSEZL is provided in Oil Spill	Item	Quantity	Oil Spill Dispersants	5000 ltr.	Absorbent pads	2000 Nos.	Portable dispersant storage tank: 1000 ltr. Capacity	1 no.	Portable pumps	2 nos.	Oil Containment Boom-Length 2000 metres, Height -1500 mm, Draft-900mm, Free Board-600mm	2000 m	Skimmer-KOMARA 15 Duplex Skimmer System with floating IMP 6 Pump.	4 Nos.	12.5T Flexible Floating Storage Tank (PUA).	3 Nos.	Lamor Minimax 12 m ³ skimmer	2 sets	Lamor Side Collector system (Recovery Capacity 123 m ³ / hr)	2 Nos. 2 sets	Canadyne Fence Boom (Reel model 7296/8496 with Power Pack, Towing bridles and Tow lines - 235 meter	1 No.
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		Contingency Plan, which was submitted during the last compliance period Apr'22 to Sep'22.																																																														
6.	The duration of construction phase of the project should be kept to a maximum of 8 months to avoid impact on marine environment and birds as suggested by NIO.	Already complied. Not applicable at present. Construction activity is already completed and the project is in operation.																																																														
7.	It shall be ensured that there is no displacement of people, houses or fishing activity as a result of the project.	Not Applicable Location of SPM is unmanned (approximately 8.6 km inside the open sea from the shore) hence; there is no displacement of people, houses or fishing activity as a result of the project.																																																														
8.	The project proponents must make necessary arrangements for disposal of solid wastes and for the treatment of effluents / liquid wastes. It must be ensured that the effluents / liquid wastes are not discharged into the seawater.	Complied. No used oil / spent oil generated during compliance period. No other type of hazardous waste as well as no effluent or liquid waste are generated from operation of SPM or discharged into the sea water. The non-hazardous solid waste generated from on-shore SPM operational activity is being handled and managed as per 5R concept for environmentally sound management. In order to analyzed marine water quality, marine sampling (surface, bottom & sediment) is being carried out at a location nearby SPM by NABL and MoEF&CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. Summary of the same for duration from Oct'22 to Mar'23 is mentioned below. Total Sampling Locations: 09 Nos. <table><tr><th rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="3">Surface</th><th colspan="3">Bottom</th></tr><tr><th>Min</th><th>Max</th><th>Avg.</th><th>Min</th><th>Max</th><th>Avg.</th></tr><tr><td>pH</td><td>--</td><td>7.96</td><td>8.28</td><td>8.17</td><td>7.68</td><td>8.14</td><td>8.02</td></tr><tr><td>BOD (3 Days @ 27 °C)</td><td>mg/L</td><td>2.4</td><td>3.4</td><td>2.92</td><td>BDL (MDL:1.0)</td><td>BDL (MDL:1.0)</td><td>BDL (MDL:1.0)</td></tr><tr><td>TSS</td><td>mg/L</td><td>86</td><td>162</td><td>129.76</td><td>78</td><td>148</td><td>110.48</td></tr><tr><td>DO</td><td>mg/L</td><td>5.8</td><td>6.32</td><td>6.08</td><td>5.63</td><td>6.22</td><td>5.91</td></tr><tr><td>Salinity</td><td>ppt</td><td>35.02</td><td>36.82</td><td>35.71</td><td>35.56</td><td>37.02</td><td>36.24</td></tr><tr><td>TDS</td><td>mg/L</td><td>35108</td><td>37210</td><td>35902</td><td>35614</td><td>37840</td><td>36425</td></tr></table>	Parameter	Unit	Surface			Bottom			Min	Max	Avg.	Min	Max	Avg.	pH	--	7.96	8.28	8.17	7.68	8.14	8.02	BOD (3 Days @ 27 °C)	mg/L	2.4	3.4	2.92	BDL (MDL:1.0)	BDL (MDL:1.0)	BDL (MDL:1.0)	TSS	mg/L	86	162	129.76	78	148	110.48	DO	mg/L	5.8	6.32	6.08	5.63	6.22	5.91	Salinity	ppt	35.02	36.82	35.71	35.56	37.02	36.24	TDS	mg/L	35108	37210	35902	35614	37840	36425
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	Adani Ports and Special Economic Zone Limited, Mundra	From : Oct'22 To : Mar'23
Status of the conditions stipulated in Environment Clearance under CRZ notification		

Sr. No.	Conditions	Compliance Status as on 31-03-2023
		<p>*BDL – Below Detection Limit *MDL – Minimum Detection Limit</p> <p>Please refer Annexure – 3 for detailed analysis reports. Approx. INR 15.32 Lakh is spent for all environmental monitoring activities during the compliance period i.e. FY 2022-23 for overall APSEZ, Mundra.</p>
9.	The camps of labor shall be kept outside the Coastal Regulation Zone area. Proper arrangements for cooking fuel shall be made for the labor during construction phase so as to ensure that mangroves are not cut / destroyed for this purpose.	<p>Complied. Not applicable at present.</p> <p>Construction activities are completed and project is in operational phase.</p>
10.	Regular drills should be conducted to check the effectiveness of the on-site Disaster Management Plan. The recommendations made in the Environmental Management Plan and Disaster Management Plan, as contained in the Environmental Impact Assessment and Risk analysis reports of the project, shall be effectively implemented.	<p>Complied.</p> <p>Disaster Management plan is in place and implemented. Updated DMP was submitted to the MoEF & CC along with half yearly compliance report for the period from Apr – 2016 to Sep – 2016 and there is no further change.</p> <p>On Site Emergency Response Plan and Crisis Management Plan updated on January-2022 is in place and implemented. The updated Onsite emergency plan were submitted along with previous EC compliance report submission for the period Oct'21 to Mar'22.</p> <p>Oil spill contingency plan is in place to handle Tier 1 level oil spills considering different accident scenarios, and the vulnerable areas are identified and mitigation plan is prepared. The Oil spill contingency response plan updated on 30.07.2022 is in place and implemented. Please refer Compliance of Specific Condition No. 5 for further details.</p> <p>Mock drills are conducted regularly by APSEZ. Last Oil Spill Mock drill was conducted on 30.11.2022. Updated Oil Spill Mock Drill report as a Regional Level Pollution Response exercise is enclosed as Annexure - 4.</p> <p>All the recommendations given in the report of NIO and Tata AIG Risk Management Services are implemented. Few examples are provided below.</p>

Status of the conditions stipulated in Environment Clearance under CRZ notification

Sr. No.	Conditions	Compliance Status as on 31-03-2023						
		<p>Few Marine EIA recommendations:</p> <table><tr><td>Temporary colonies of workforce should be located sufficiently away from the HTL with proper sanitation. Adequate arrangement of fuel supply to the workers should be made to discourage them from using mangroves for firewood.</td><td>Construction activity is already completed. Most of the construction labours were residing in the nearby villages where all basic facilities are easily available. However, for those residing near the construction site, infrastructure facilities such as water supply, fuel, sanitation, first aid, ambulance etc. were provided by APSEZL.</td></tr><tr><td>As a step towards improvement in marine environment quality, mangrove afforestation of intertidal mudflats should be encouraged through adequate institutional support.</td><td>25 hectare of mangrove plantation with a cost of 10 Lakh is already completed near railway yard in consultation with Dr. Maity, Mangrove consultant of India. Details on mangroves afforestation & Green belt development carried out by APSEZ till date is annexed as Annexure - 1.</td></tr><tr><td>The prevailing traffic control management of deep-sea ships navigating through the gulf needs thorough review and introduction of state of the art VTS should be considered.</td><td>APSEZ is practicing well defined traffic control procedure. A VTS service for Gulf of Kutch is provided by the VTS Gulf of Kutch, operated by Directorate General of Lighthouses and Lightships (DGLL), Govt. of India. Marine Control of APSEZ provides traffic update to vessels in Mundra Port Limit on VHF Channel- 77. Arrival and departure information before arrival and departure respectively in Gulf of Kutch is provided to VTMS information cell through agent or by directly sending mail to vtsmanagergulfofkutch@yahoo.com and vtsgok@yahoo.com Mundra port has subscribed and taking VTMS feed from Kandla from link www.vts.gov.in.</td></tr></table>	Temporary colonies of workforce should be located sufficiently away from the HTL with proper sanitation. Adequate arrangement of fuel supply to the workers should be made to discourage them from using mangroves for firewood.	Construction activity is already completed. Most of the construction labours were residing in the nearby villages where all basic facilities are easily available. However, for those residing near the construction site, infrastructure facilities such as water supply, fuel, sanitation, first aid, ambulance etc. were provided by APSEZL.	As a step towards improvement in marine environment quality, mangrove afforestation of intertidal mudflats should be encouraged through adequate institutional support.	25 hectare of mangrove plantation with a cost of 10 Lakh is already completed near railway yard in consultation with Dr. Maity, Mangrove consultant of India. Details on mangroves afforestation & Green belt development carried out by APSEZ till date is annexed as Annexure - 1 .	The prevailing traffic control management of deep-sea ships navigating through the gulf needs thorough review and introduction of state of the art VTS should be considered.	APSEZ is practicing well defined traffic control procedure. A VTS service for Gulf of Kutch is provided by the VTS Gulf of Kutch, operated by Directorate General of Lighthouses and Lightships (DGLL), Govt. of India. Marine Control of APSEZ provides traffic update to vessels in Mundra Port Limit on VHF Channel- 77. Arrival and departure information before arrival and departure respectively in Gulf of Kutch is provided to VTMS information cell through agent or by directly sending mail to vtsmanagergulfofkutch@yahoo.com and vtsgok@yahoo.com Mundra port has subscribed and taking VTMS feed from Kandla from link www.vts.gov.in .
Temporary colonies of workforce should be located sufficiently away from the HTL with proper sanitation. Adequate arrangement of fuel supply to the workers should be made to discourage them from using mangroves for firewood.	Construction activity is already completed. Most of the construction labours were residing in the nearby villages where all basic facilities are easily available. However, for those residing near the construction site, infrastructure facilities such as water supply, fuel, sanitation, first aid, ambulance etc. were provided by APSEZL.							
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	Adani Ports and Special Economic Zone Limited, Mundra	From : Oct'22 To : Mar'23
Status of the conditions stipulated in Environment Clearance under CRZ notification		

Sr. No.	Conditions	Compliance Status as on 31-03-2023	
		Few Tata AIG Risk Assessment Recommendations:	
		There should be facilities of boom, skimmer, dispersant, diving suits, firefighting equipment and excellent communication facilities.	10 Dolphin tugs fitted with Oil Spill Dispersant boom and proportionate pump to mix OSD and Sea water as required; out of them 10 Dolphin Tugs are fitted with a fire curtain and remote-controlled fire monitors.
		In the event of oil spillage the oil slick normally will be carried away by water current and wind. It is very difficult to identify oil slick patches by boats/vessels, hence it is suggested that GAPL may take help from coast guard/Navy for aerial surveillance in order to identify and monitor oil slick movement.	Oil spill contingency plan is in place to handle Tier 1 level oil spills considering different accident scenarios, and the vulnerable areas are identified and mitigation plan is prepared. Oil spill contingency plan updated & approved by coast guard, which was submitted during last half yearly compliance report.
11.	The entire stretch of the pipelines shall be buried underground except at the booster pumping station, which will be properly fenced and the station would be manned round the clock. The buried lines will be protected with anticorrosive coal tar based coating. The coating will be tested by high voltage detector in accordance with prescribed standards.	Complied. Entire SPM pipeline is buried underground. Total pipeline length is 15.4 km including 8.6 km inside the open sea and 6.8 km on landward side. Booster pump is not provided throughout the pipeline. However the material is transferred by using pumping system of respective vessels berthed at SPM. Anticorrosive 3 LPE coating is provided to the portion of onshore pipeline while offshore pipeline is also protected by concrete coating. For offshore pipeline, Cathodic Potential (CP) survey is being done once in three years. Last CP inspection of offshore pipeline done in Mar'2021. The report of offshore pipeline, Cathodic Potential (CP) survey were submitted along with previous EC compliance report submission for the period Oct'21 to Mar'22. For onshore pipeline CP survey is being done by APSEZ on monthly bases. Monthly reports of CP survey for this compliance period are enclosed as Annexure – 5 .	
12.	Markers shall be installed at every 30 m to indicate the position of the line. Regular patrolling of the pipelines	Complied. Markers are installed at every 30 m to indicate position of pipeline. Details of the same were submitted during half yearly EC Compliance	

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	needs to be done. This will help in identifying any activity that have the potential to cause pipeline damage or to identify small leaks whose effects are too small to be detected by instrument.	<p>report for the period Oct'18 to Mar'19.</p> <p>Pressure at vessel and reception points of transfer line is being monitoring during operation to ensure no leakage in pipeline.</p> <p>Regular patrolling of pipeline is being done by APSEZL Security Department. Following mitigation plan is followed in case of small leaks leading to spills.</p> <table><tr><th>Activity</th><th>Adequacy of Measures</th></tr><tr><td>Hose Connection / Disconnection (liquid operation)</td><td>It is collected in deep tray in case of leakage. Stop the supply of liquid discharge.</td></tr><tr><td>Hose Connection / Disconnection (liquid operation)</td><td>Immediately stop the supply of liquid discharge. Marine break away coupling available for control of load.</td></tr><tr><td>Tanker discharge operation (SPM operation)</td><td>Emergency operation shut off (stopping the discharge)</td></tr></table>		Activity	Adequacy of Measures	Hose Connection / Disconnection (liquid operation)	It is collected in deep tray in case of leakage. Stop the supply of liquid discharge.	Hose Connection / Disconnection (liquid operation)	Immediately stop the supply of liquid discharge. Marine break away coupling available for control of load.	Tanker discharge operation (SPM operation)	Emergency operation shut off (stopping the discharge)
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13.	There should be display boards at critical locations along the pipeline viz. road / rail /river crossings giving emergency instructions as well as contact details of GAPL. This will ensure prompt information regarding location of accident during any emergency. Emergency Information board should contain emergency instructions in addition to contact details.	<p>Complied.</p> <p>Display boards with emergency contact detail are provided at critical locations.</p> <p>Photographs of the same were submitted as part of the compliance report for the period from Oct'16 to March'17 and there is no farther change.</p>									
14.	During operation phase, proper precautions should be taken to avoid any oil spills and no oily wastes shall be discharged into the water bodies.	<p>Complied</p> <p>During operation, SPM team takes responsibility and actively supervises the operation. Inspection and maintenance activities are carried out regularly for prevention of any kind of oil spill at SPM.</p> <p>No liquid waste are generated / discharged from the project activity. In order to analyze marine water quality, marine sampling is being carried out at a location near SPM. Please refer condition no 8 for further details.</p>									
15.	All conditions stipulated by	Complied									

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	the Forest and Environment Department, Government of Gujarat should be strictly implemented.	All the conditions stipulated by Forest and Environment Department are being complied. Point wise compliance report of CRZ recommendations issued vide letter No. ENV-10-2002-124-P (Part1) dated 8th October 2003 is enclosed as Annexure- A .
16.	All conditions stipulated in Gujarat Pollution Control Board vide their letter No. PC/NOC/381/1039 dated 8 th January, 2002 should be implemented.	Complied. Consent to Operate (CC&A) was granted by GPCB based on the compliance of conditions of the No Objection Certificate (CtE). This CC&A is renewed from time to time based on its validity. The last CC&A renewal has granted and issued by GPCB vide Order no. WH 117830 issued dated 29.03.2022 & valid till 26 th April, 2027. Copy of the renewed CC&A were submitted along with previous EC compliance report submission for the period Oct'21 to Mar'22.
B. General Condition		
1	Construction of the proposed structures should be undertaken meticulously confirming to the existing Central / local rules and regulations. All the construction designs / drawings relating to the proposed construction activities must have approvals of the concerned State Government Department / Agencies.	Complied. Not applicable at present. Construction activities are completed & project is in operation stage. Entire SPM pipeline is buried underground. Total pipeline length is 15.4 km including 8.6 km inside the open sea and 6.8 Km on landward side. Construction activities are carried out based on the approvals of the concerned state government department and prevailing laws.
2	The project authorities should take appropriate community development and welfare measures for the villagers in the vicinity of the project site, including drinking water facilities. A separate fund should be allocated for this purpose.	Complied APSEZ is actively working with local community around the project area and provides required support for their livelihood and other concerns through the CSR arm – Adani Foundation. Adani Foundation is working in main four persuasions as below. <ul style="list-style-type: none">  Education  Community Health  Rural Infrastructure  Sustainability Livelihood Brief information about activities in the main four persuasions is mentioned below. Activities carried out for the same are summarized as below.

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Sr. No.	Conditions	Compliance Status as on 31-03-2023							
		<table><tr><th>Area</th><th>Activity</th></tr><tr><td>Community Health</td><td><ul style="list-style-type: none">Mobile Heath Care Units and Rural Clinics09 Rural Clinics06 villages of Mundra, 02 villages of Anjar & 01 village Mandvi block has benefited by rural clinic service.Total Patients Benefitted FY 22-23:- 25088 (direct & indirect).5 financially challenged patients has been supported with Dialysis treatment at 97 Times which added day in their Life.<p>Health camp:</p><ul style="list-style-type: none">Specialty camps, Eye checkup camps, Blood donation camp, Anti-tobacco awareness camp, TB screening, and other are conducted in core villages as well as in labour colonies.Specialty health (Gynec , Pediatric eye specialty health camp):- 1527 Patients Benefited.General health camp:- 3379 Patients benefitedWomen's Health: Provided health services to over 1150 women through 102 + Menstrual Hygiene workshops.Dialysis Support: During this year, 4 patients were supported for regular dialysis (twice a week) with partial supportTotal 590800 CC quantity of Blood had been donated by 1710 Employees.Medical Supports: 2460 beneficiary in 63 village.TB screening & Awareness session: benefited 1795.25 villages and 07 fishermen settlements covered, with 90 types of general and lifesaving medicines through Mobile healthcare unit1491 –Economically Challenged patients have been supported for operation, OPD, IPD, Medicines and lab-test.For Preventive health care General and multispecialty camps Pediatric camp, General Health camps in 9 villages and Super specialist camp which benefitted more than 4906 patients of Mundra Taluka.Cattle Health Camp: Adani Foundation and Animal Husbandry department Veterinary Jointly organizing cattle health Awareness and vaccination programs in 24 Villages of our periphery villages. Total 17299 cattle of 19 Villages had benefitted with different kind of medicines and vaccines.Lumpy Disease Vaccination Drive: Total 40 000 cattle were covered through therapeutic and ayurvedic treatment and Nutritive Cattle feed Support with association District Animal Husbandry department through vaccination and awareness drive.</td></tr><tr><td>Sustainable Livelihood – Fisher folk, Agriculture & Women</td><td><ul style="list-style-type: none">Government scheme Awareness session was held in association with Fisheries department Bhuj to facilitate pagadiya fishermen by providing fishing kits to seven Fishermen. The coordination was made by Adani Foundation to process application.To promote Natural farming Adani Foundation has originated cow-based farming initiative with interconnected techniques which can increase farmer yield.Adani foundation and Agri Department jointly organized district level workshop on Natural Farming Practice with Gram Seva.Natural farming- 1392 farmers benefitted by 20 nos of training from which 60 farmers chemical usage is reduced to half extent in 500 Acres approximately.</td></tr></table>	Area	Activity	Community Health	<ul style="list-style-type: none">Mobile Heath Care Units and Rural Clinics09 Rural Clinics06 villages of Mundra, 02 villages of Anjar & 01 village Mandvi block has benefited by rural clinic service.Total Patients Benefitted FY 22-23:- 25088 (direct & indirect).5 financially challenged patients has been supported with Dialysis treatment at 97 Times which added day in their Life. <p>Health camp:</p> <ul style="list-style-type: none">Specialty camps, Eye checkup camps, Blood donation camp, Anti-tobacco awareness camp, TB screening, and other are conducted in core villages as well as in labour colonies.Specialty health (Gynec , Pediatric eye specialty health camp):- 1527 Patients Benefited.General health camp:- 3379 Patients benefitedWomen's Health: Provided health services to over 1150 women through 102 + Menstrual Hygiene workshops.Dialysis Support: During this year, 4 patients were supported for regular dialysis (twice a week) with partial supportTotal 590800 CC quantity of Blood had been donated by 1710 Employees.Medical Supports: 2460 beneficiary in 63 village.TB screening & Awareness session: benefited 1795.25 villages and 07 fishermen settlements covered, with 90 types of general and lifesaving medicines through Mobile healthcare unit1491 –Economically Challenged patients have been supported for operation, OPD, IPD, Medicines and lab-test.For Preventive health care General and multispecialty camps Pediatric camp, General Health camps in 9 villages and Super specialist camp which benefitted more than 4906 patients of Mundra Taluka.Cattle Health Camp: Adani Foundation and Animal Husbandry department Veterinary Jointly organizing cattle health Awareness and vaccination programs in 24 Villages of our periphery villages. 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		<ul style="list-style-type: none"> • 100 nos. of Facilitation of Home Biogas-under Gobardhan Yojna. • Benefited 837 people linkages with Govt. cow based Nurturing Scheme. • Supported 1500 farmers for barrel & wormi compost. • 19 nos. of Market Linkage for supporting to Green carnival at Samudra Township & Shantivan colony 17 472 Kg Vegetable with Rs. 4.36 Lacs. • 257 Farmers have started to preparing Jiva Mrut & Gaukrupa Amrutam Bio-fertilizer and using in agricrop. Series of Training is arranged by ATMA and Adani Foundation. • Adani Foundation has also provided 7.31 lacs kg Dry Fodder and 23.59 lacs kg Green fodder in 29 villages of Mundra and Anjar Block to support the resource dependent villagers, to avoid their dependency on mangroves. The expenditure for fodder supporting activities was approx. 200.89 Lacs during FY 2022-23. • Adani Foundation provides Good Quality dry and green fodder to 29 Villages. Project is covering total 14116 Cattels / 3008 farmers and hence enhancing cattle productivity. Dry Fodder 731230 Kg Green -2359204 Kg. • Individual Fodder Cultivation: Farmers were Aware, Convince and trained to cultivate super Napier Grass as on farm projects to reduce their Fodder Dependency and expense. With that effort 192 farmers have Adopted and Cultivated Super NAPIER Grass in 190-acre area and produce 3800 Fodder Tons Yield annually, lead to save Approx Rs 52 Lacs of farmers. • Grass Land development: AF converted 205 acres of denuded village common pastureland gauchar into fertile and productive grassland in Zarpara and siracha village to transform into Fodder Sustain village. • Self Help Groups (SHGs): Established 82 self-help groups in various rural and urban areas to provide financial and social support to women We provided training and capacity building workshops to members of these SHGs to help them develop income generating activities and improve their livelihoods Through this initiative, we have empowered over 850 women to become self-reliant with Savings of Rs 30 42 Lacs. • Mangrove plantation and Nursery development work has created a two-facet impact by providing Livelihood to Fisherfolk during two months Fishing during Off season and developing 162 hector dense mangrove afforestation. • 5200 Men days work provide to 285 Fisherfolk of Luni, Sekhdiya and Bhadreshwar Villages in coordination with Horticulture Det. • Formed Sagar Saheli SHG of Navinal Fisherfolk Women and Linked with DRDA after completion of Stitching Training, received first order of Rs 80 000 to prepare Cotton Bags. Total 12 Women are engaged and planning to expand with more Women and Order. • During FY2022-23 Approx. INR 185.37 lakh were spent for Fisherfolk Amenities work in different core areas. • Till FY 2022-23, Adani Foundation has done total expenditure of INR 1338.19 lakh for Fisherfolk Amenities work in different core areas. • To protect Cattles against Bovine Brucellosis zoonotic disease, Awareness and vaccination program is ongoing with Kutch fodder fruit & Forest development trust (KFFT) in our 11 Villages. In end of the year 100 percentage female calves will be benefitted by this initiative.

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			<ul style="list-style-type: none"> Current year KKPC served for Date Packaging box, Milk Supply to Colonies, NB 21 Off suits Supply, Vegetable Seed, Mineral Mixture and Cattle feed supply and plan to extend more service. The company has been set up with 237 Farmers shareholders. Current Year turnover is Rs 28 89 lacs by started Different Kind of Initiatives. Skill Development and Income Generation –Adani Foundation is working with 15 Self-help group and supporting to develop entrepreneur skills to become self-reliant, sourcing more than 850 women to absorb in various job.
	Education		<ul style="list-style-type: none"> Conduct baseline assessment of 7034 Students, 3364 Students were progressive learner, 1403 Students mainstreamed. ISLM (International School Library Month) was celebrated by 69 Utthan schools. And school from Russia joined with us in zoom to engage under the virtual connection around the world. 100 hours capacity building programs for Utthan sahayak and school Teachers specially focusing on Foundational Literacy and Numeracy Utthan sahayak attend CBP (Capacity building program) once in every month. Utthan sahayak create 150 Worksheets on Yoga In the run up to India's 75th Independence Day celebrated across India's Azadi Ka Amrit Mahotsav The tour covers 75 heritage, tourist and archaeological sites and landmark architectural sites across Gujarat. Provided facility for preparing JNV, NMMS & PSE examination. 898 number of students participated for JNV, NMMS & PSE. Mental and Physical Cognitive Education with Joy full learning activities to 2.5- to 6-year-old children. Provide Nutritional Food Facilities. Capacity Building program for Balwadi teachers. Total 82 Active SHG Group – 850 women are engaged with Adani Foundation for Savings activity. Among 15 SHG groups are involved in income generation. We facilitate them capacity building training for quality, Marketing Finance and team work to made them self-sustain. 507 underprivileged students of Fisherman & Maldhari communities underprivileged from 8 villages taking education at the Adani Vidya Mandir school. Celebration of various days is villages school. Training Skill Development: Conducted skill development programs for women in various fields such as tailoring, handicrafts, and food processing These training programs helped women develop their skills and start their own businesses We have trained over 320 women in various skills, and many of them have started their own businesses. motivating 150 Woman from different 82 SHG's. Current year theme was Digital ALL: Innovation & technology for gender equality
	Rural Infrastructure & Environmental Sustainability		<p>Adani foundation designed and built various structure and provide service in the Health, Education, agriculture and sustainable livelihood area.</p> <p>WORK COMPLETED</p> <ul style="list-style-type: none"> 40 RRWHS structure have been completed 208 Bore-well recharging activity is completed. Percolation well Recharging work at Bhadiya & Mota Kandgra village. Sluice gate Construction to Control Flood during Flooding at Khoydivadi Vistar Bhujpur.

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		<ul style="list-style-type: none"> • Pond Beatification and Bund Strengthening at Bhujpur village. • Check dam gate valve construction at Bhujpur which controlled more than 350 MCFT water to go into sea and get recharged current year. • commissioning of Community Training Centre at Shekhadiya. • Two Pond Deepening at Zarpara under Amrut Sarovar Yojna. • Ground recharge activities (pond deepening work for 61 ponds) individually and 26 ponds under Sujlam Suflam Jal Abhiyan. • Pond Pipeline work at Prasla Vistar Zarpara which increase recharge capacity more than 25% in 100 hector area. • JCB & Hitachi Machine Support for Pre-Monsoon activities. Repairing and Maintenance work of Approach at Luni, Bavdi and Navinal Fishermen Bandar. • 3 Re-strengthening of Approach Road. • Renovate Blood storage Lab CHC Mundra Renovation Blood storage Lab CHC Mundra. • Constructed 2 nos. of CC Road of 700 mtr. • Constructed Community Training center Shekadiya. • Constructed 2 nos. Disable Widow Toilet Block • Installed R.O. Plant at Mokha with capacity 1000ltr /HR. • Constructed 4 nos. Common gathering Open Shed • Constructed 03 nos. of Water Tank at Luni Bandar. • Developed of Cricket Ground at Hatdi Village <p>ENVIRONMENT SUSTAINABILITY PROJECTS</p> <ul style="list-style-type: none"> • Miyawaki Forest Development, Nana Kapaya - Plantation of 5880 saplings of different 42 species is completed which will result in dense forest within 2 years • Smruti Van – Plantation more than 47,000 sapling with more than 115 species through Miyawaki methodology. • Ecosystem Restoration, Guneri – Grassland ecosystem restoration and mangrove conservation in 40 Ha area over a period of 4 years. The site visit and soil samplings conducted by GES team. Regular bimonthly meeting conducted to assess the annual phase wise growth of ongoing activities. • Multi-Species Mangrove Park - Adani Foundation at Mundra's initiated multi-species plantation of mangroves in Kutch association with GUIDE. During 2018-2019 (Phase-I) multi-species mangrove plantation was carried out in 10 ha, during Phase-II (2019-2020) it was 02 ha and during Phase III (2020-2021) it is 01 ha. During FY 2021-22, 03 ha area coastal stretches have been planted with species. During current FY 2022-23, 04 Hecter plantation has been planted with various species. Total 20 Ha. multi-species mangrove plantation has been carried out till March-23 association with M/s. GUIDE, • Mangroves Biodiversity Park within one year • Home biogas - Under Gram Utthan Project, Adani Foundation is supporting home biogas to farmers to Uthhan Villages phase wise. Total 325 farmers are supported with Biogas as sustainable environment protection. • As per SORI use of biogas each farmer can save Rs.23400/year. <p>Water Conservation Projects –</p> <ul style="list-style-type: none"> • Large number of water harvesting structure (18 Nos. of check dams in coordination with salinity department) and Augmentation of 3 check dams.

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			<ul style="list-style-type: none"> • Ground recharge activities (pond deepening work for 61 ponds) individually and 26 ponds under Sujlam Suflam Jal Abhiyan were built leading to a significant increase in water table and higher returns to the farmers. • New Pond Deepening Under Ajadi ka Amrut Mahotsav done in Goyarsama village Approx Deepening Capacity is 12000 Cum. • Roof Top Rainwater Harvesting 145 Nos. (40 Nos. current FY 2022-23) which is having 10,000 litre storage which is sufficient for one year drinking water purpose for 5 people family. • Recharge Borewell 208 Nos (19 Nos. current FY 2022-23) which is best ever option to direct recharge the soil. • Drip Irrigation approx. 1505 Farmers benefitted in coordination with Gujrat Green Revolution Company till date. • Bund construction on way of Nagmati River could save more than 575 MCFT water quantity which recharged in ground due to which borewell depth decreased by 50-100 Ft in Zarpara, Bhujpur and Navinal Vadi Vistar. • Pond Pipeline work at Prasla Vistar Zarpara which increase recharge capacity more than 25% in 100 hector area. • Check dam gate valve construction at Bhujpur which controlled more than 350 MCFT water to go into sea and get recharged current year.
		Skill Development	<p>Over the previous few years, Adani Skill Development Center has assessed various aspects of the technical, leadership and soft skills gaps that organizations, in general, face and accordingly focuses on imparting required training in those areas in partnership with various colleges and institutes.</p> <p><u>ASDC, Mundra</u></p> <ul style="list-style-type: none"> • Youth Employment: - Adani Foundation is committed for youth employment with imparting technical and Non-Technical Training for Fisherfolk Youth and started Electrical, Welder and Masson work training under Adani Skill Development Centre. • 23 Youth have been Placed in Different company after Completion of Technical training. • Total 217 Fisherfolk are Employed and earning on Monthly Base. Average Monthly Income Rs.14500/ Individual. <p><u>ASDC and Thermax Foundation Done MoU</u></p> <ul style="list-style-type: none"> • ASDC and Thermax Foundation Jointly Organized, Skill Development training program for " Dhrab Village youth", In 1st phase completed Domestic Data Entry Operator training with 50 students (25 girls and 25 boys) • Chief Guest of this program was Mr. Anees Shaikh-Head, ER & Administration, Thermax, Ashlambhai Turk-Dhrab Village Sarpanch remained present • CSR head Thermax Ms. Sujata Deshpande has joined from Pune and given motivation and best wishes for training. • In this MOU ASDC has provided training of Digital Literacy to 1341 students and Basic Functional English to 2659 students in Kachchh District Schools. As per MOU Kachchh District Education Office has provided 4000 candidates to us for training (Adani Skill Development Centre). Funding from Thermax, CFS and DEO made it possible • Skill Development and Income Generation –Adani Foundation is working with 82 Self-help group and supporting to develop entrepreneur skills to become self-reliant, sourcing more than

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			<p>850 women to absorb in various job –this will give them identity, confidence and right to speak in any decision for home, village and working area.</p> <ul style="list-style-type: none"> • Soft Launch of Data Entry Operator Batch: Soft launched Data Entry Operator Batch with 50 candidates under Thermax Foundation Tie up. <p>ASDC, Bhuj</p> <ul style="list-style-type: none"> ✓ Mud Work Training–Outreach Batch at Samundra township Total 45 candidates are enrolled. ✓ Soft Launch of Data Entry Operator Batch Soft launched Data Entry Operator Batch with 50 candidates under Thermax Foundation Tie-up ✓ Soft Launch of Solar Panel Manufacturing Technician Training of Solar Panel Manufacturing Technician Training at Bhuj, ITI with 25 candidates. ✓ Soft Launch of DL Training under DEO Project Soft Launch of DL Training at AVMB School with 61 Students <p>Tie Ups with (Thermax Foundation, Empazer, Navin Group and DEO Kutch @ Rs.24.25 lacs</p> <ul style="list-style-type: none"> • MOU with Kachchh District Education Office. In this MOU we will provide training of Digital Literacy and Basic Functional English in Kachchh District Schools. As per MOU Kachchh District Education Office will provide minimum 4000 candidates to us for training (Adani Skill Development Centre). • During FY 2022-23, Total 4706 people directly trained in various trainings to enhance socio economic development. <p>Please refer Annexure – 2 for full details of CSR activities carried out by Adani Foundation in the Mundra region. Budget for CSR Activity for the FY 2022-23 is to the tune of INR 1894.42 lakh. Out of which, Approx. INR 1527.49 lakh is spent during the FY 2022-23.</p>
3	To meet any emergency situation, appropriate fire – fighting system should be installed. Appropriate arrangements for uninterrupted power supply to the environment protection equipment and continuous water supply for the firefighting system should be made.	Complied.	<p>Tug (Dolphin-11) has firefighting system of 1200 m3/hr. along with 20 ton lifting "A" frame and diving support facility for support at offshore.</p> <p>With respect to onshore facilities valve station, pumping station and transportation pipeline, foam base fire tender is available.</p> <p>With respect to onshore facilities valve station, pumping station and transportation pipeline, foam base fire tender, fire water network is available Fire-fighting system has been installed and maintained to meet emergency situations. Additionally for emergency, DG Set is</p>

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		provided for fire water pumps to ensure continuous water supply for firefighting purpose. Detail information on firefighting facility available at APSEZL was submitted as part of the compliance report for the period from Oct'16 to March'17 and there is no farther change.
4	A separate Environment Management Cell with suitably qualified staff to carry out various environment related functions should be set up under the charge of a Senior Executive who will report directly to the Chief Executive of the Company.	<p>Complied.</p> <p>APSEZL has a well-structured Environment Management Cell, staffed with qualified manpower for implementation of the Environment Management Plan at site. Site team report to Sr. Manager (Environment) at Corporate, who heads the Environment Management Cell who directly reports to the top management. Environment Management Cell Organogram were submitted as part of compliance report submission for the duration of Apr'21 to Sep'21. And there is no further change.</p>
5	The funds earmarked for environment protection measures should be maintained in a separate account and there should be no diversion of these funds for any other purpose. A year wise expenditure on environmental safeguards should be reported to this Ministry's Regional Office at Bhopal.	<p>Complied.</p> <p>Separate budget for the Environment Protection measures is earmarked every year. All environmental and horticulture activities are considered at group level and budget allocation is also done accordingly. No separate bank account is maintained for the same however, all the expenses are recorded in advanced accounting system of the organization.</p> <p>Budget for environmental management measures (including horticulture) for the FY 2022-23 is to the tune of INR 1448.06 lakh. Out of which, Approx. INR 1366.28 lakh are spent during the year FY 2022-23. Detailed breakup of the expenditures for the past 3 years is attached as Annexure – 6.</p>
6	Full support should be extended to the officers of this Ministry's Regional Office at Bhopal and the officers of the Central and State Pollution Control Board by the project proponents during their inspection for monitoring purposes, by furnishing full details and action plans including the action taken reports in respect of mitigative measures and	<p>Complied</p> <p>APSEZL is always extending full support to the regulatory authorities during their visit to the project site.</p> <p>Last visit of Regional Office, GPCB was done on 14.02.2022 with respect to SPM project and compliance of the same has been submitted vide our letter dated 16.02.2022. Details of the same Details were submitted during half yearly EC Compliance report for the period Oct'21 to Mar'22.</p> <p>Inline to the compliance certification process of Environment Clearance condition of Waterfront Development Plan, RO, MoEF&CC Bhopal had visited the site on 27th & 28th January, 2020 for</p>

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	other environmental protection activities.	<p>compliance verification. APSEZ provided all requisite information and documents required by the Regional Officer MoEF&CC). During the said compliance verification visit and as per the compliance certification received, there was no major non-compliance observed.</p> <p>Inline to the compliance certification process of Consent to Operates of existing facilities developed under Waterfront Development Plan, RO, GPCB, Gandhidham had visited the site on 17th March, 2021 for compliance verification. APSEZ provided all requisite information and documents required by the Regional Officer GPCB). During the said compliance verification visit and as per the compliance certification received, there was no non-compliance observed.</p> <p>Inline to the compliance of MoEF&CC Order dated 18th September, 2015, Joint Review Committee (JRC) comprising officials from various competent authorities visited the APSEZ, Mundra from 1st to 3rd September, 2021 to monitor the progress of implementation of the conditions stipulated in the order. APSEZ provided all requisite information and documents required by the JRC. As per the report received by MoEF&CC vide dated 01.12.2021, there was no non-compliance observed.</p>
7	In case of deviation or alteration in the project including the implementing agency, a fresh reference should be made to this Ministry for modification in the clearance conditions or imposition of new one for ensuring environmental protection. The project proponents should be responsible for implementing the suggested safeguard measures.	<p>Point noted.</p> <p>There is no change in the approved project proposal.</p>
8	This Ministry reserves the right to revoke this clearance, if any of the conditions stipulated are not complied with to the satisfaction of this Ministry.	Point noted.
9	This Ministry or any other competent authority may	Point noted.


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	stipulate any other additional conditions subsequently, if deemed necessary, for environmental protection, which should be complied with.	
10	A copy of the clearance letter should be marked to the concerned Panchayat / local NGO, if any, from whom any suggestion / representation has been received while processing the proposal.	Not applicable at present
11	State Pollution Control Board / Committee should display a copy of the clearance letter at the District Industries Center and Collector's Office/ Tehsildar's Office for 30 days from the date of receipt of this letter.	Not Applicable This condition does not belong to project proponent.
12	The project proponent should advertise at least in two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned informing that the project has been accorded environmental clearance and copies of clearance letter are available with the Gujarat Pollution Control Board and may also be seen at the website of the Ministry of Environment & Forests at http://www.envfor.nic.in/	Already Complied.
13	The project proponents should inform regional	Already Complied

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	Office Bhopal as well as the Ministry, the date of financial closure and final approval of the project by the concerned authority and the date of start of work.	
14	The project proponent will obtain Forest clearance for any stretch of land if it passes through the forest land.	Not Applicable No forest land was involved in the project.
15	So as to maintain ecological features and avoid damage to the ecosystem, movement of vehicles in the Inter Tidal Zone shall be restricted to minimum.	Complied. All activities are carried out as per the permissions obtained from competent authorities. No unauthorized movement of vehicles is allowed in the intertidal zone.
16	Since the pipeline passes along mangrove areas and the mud flats of Mundra area, the project proponents will ensure adequate protection to mangroves.	Complied. Not applicable at present Construction activities are completed & project is in operation stage. Please refer to specific condition no 1 for detailed reply regarding mangrove plantation activity.
17	Budgetary break up for Environmental Management Plan for the project to be mentioned.	Complied. Please refer to general condition no 5 for detailed reply regarding budgetary break up.

Annexure – A

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Half yearly Compliance report of CRZ recommendation for "SPM, COT and connecting pipeline at Mundra Port, Dist. Kutch in Gujarat" issued by DoEF, GOG vide letter no. ENV-10-2002-124-P (Part1) dated 8th October 2003.

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1	The provision of the CRZ notification of 1991 and its amendments issued from time to time shall be strictly complied with by the GAPL.	<p>Complied.</p> <p>Construction activities are completed and the project is in operation phase. All stipulations with respect to the CRZ notification and its subsequent amendments are complied with.</p>
2	This recommendation is only for those activities proposed to be commissioned before the end of the year 2008 as mentioned in the bar chart submitted by GAPL.	<p>Point noted.</p> <p>Construction activities are completed and the project is in operation phase.</p>
3	A separate clearance shall be obtained by the GAPL for construction of the SPM No. 3 and 4, corresponding pipelines and COTs after demonstrating the compliance of the conditions, ecological upliftment activities undertaken successfully and mitigative measures implemented while developing the SPM no.1 and corresponding COT. A regional EIA shall also be commissioned immediately by the GAPL and all future development should be based on the outcome of the said regional EIA only.	<p>Point Noted.</p> <p>APSEZL has only developed SPM no. 1 so far. SPM no. 3 and 4 are not developed yet and required permissions for the same will be obtained by following procedures mentioned in respective notifications.</p>
4	Before commissioning of the construction activities, the construction design and pipeline alignment shall be validated/	<p>Complied.</p> <p>Construction activities are completed and the project is in operation phase.</p>

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	approved by National Institute Oceanography to ensure that there is no negative impact on the coastal morphology, hydrodynamics and ecological systems including the corals, if any. The mitigative measures as may be suggested by the NIO for this purpose shall be implemented by the GAPL.	<p>The EIA report was prepared by NIO and specific design considerations were taken into account for carrying out various studies for preparation of the same. Findings of the studies were considered before commissioning of the construction activities.</p> <p>There are no corals present at the project site.</p>
5	A comprehensive EIA shall be prepared and submitted to this Department by the GAPL, before commissioning of the SPM. All the suggestions for environmental protection /management that may be given in the comprehensive EIA shall be implemented by the GAPL.	<p>Complied.</p> <p>EIA study has been completed and report is already submitted to MoEF&CC and other concerned authorities. Based on the same, Environment and CRZ clearance was granted by MoEF&CC.</p> <ul style="list-style-type: none"> A Regional Impact Assessment study to identify impacts of all the existing as well as proposed project activities in Mundra region inline to ToR issued by GCZMA. CIA Report was prepared inline to the ToR by Chola MS and the same was submitted to the GCZMA on 30.04.2018. Details of the same were submitted along with half yearly EC Compliance report for the period Apr'19 to Sep'19. Presentation on the findings of the report was made to GCZMA committee on 4th October 2019 and after detailed discussion, authority has decided to constitute committee to discuss the details of the report further. Reminder Letter vide dated 07.09.2020 & 10.03.2021 submitted to the GCZMA, Gandhinagar for further directives to present the findings of the CIA report in detail. Details of the same were submitted along with previous half yearly EC Compliance report for the period Oct'20 to Mar'21. Presentation done before GCZMA on 31.10.2021 and 16.02.2021 to discuss proposed EMP of CIA study in detail and way forward. GCZMA, Gandhinagar issued a letter to co-ordinate

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		<p>with various departments in the matter of CIA with Gujarat Pollution Control Board as Nodal Agency vide dated 12th July, 2022.</p> <ul style="list-style-type: none"> APSEZ submitted the letter to GPCB for detailed deliberation and suitable action / way forward vide letter dated 20th July, 2022. Details of the same were submitted during the last compliance period Apr'22 to Sep'22. <p>However, APSEZ is already complying with the Environment Management Plan (applicable to APSEZ) suggested in Cumulative Impact Assessment report. The detailed compliance, applicable to APSEZ is attached as Annexure – 7.</p>
6	The ground water shall not be tapped in any case to meet with the water requirements during construction and/or operation phases.	<p>Complied.</p> <p>APSEZ does not draw any ground water for the water requirement. Present source of water for entire port and SEZ is desalination plant and/or Gujarat Water Infrastructure Limited (GWIL).</p>
7	The GAPL shall ensure that the free flow of water in the intertidal area is not hampered due to proposed construction activities for pipeline corridor as well as other activities including the COT. Further, it shall be ensured by the GAPL that the nearby mangroves are not at all affected due to proposed development activities specifically the COT.	<p>Complied.</p> <p>Construction activity is already completed and the project is in operation phase.</p> <p>Free flow of water in the intertidal area is not hampered due to any operational activities. There are no filling or reclamation activities done at any of the creeks or mangrove areas in the vicinity of the project. As per the bathymetry study carried out by NCSCM in 2017-18, it can be concluded that there are sufficient depths at the creek mouths and all creek mouths are open allowing flushing of water.</p> <p>NCSCM study on comprehensive and integrated plan for preservation and conservation of mangroves and associated creeks in and around APSEZ and the same was submitted to the GCZMA on 04.06.2018. Details of the same were submitted along with half yearly EC Compliance report for the period Apr'19 to Sep'19.</p> <p>NCSCM final report on comprehensive and integrated plan for preservation and conservation of mangroves and</p>

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		<p>associated creeks in and around was submitted along with half yearly EC Compliance report for the period Apr'19 to Sep'19. The same was further submitted to GCZMA and MoEF&CC for their examination and recommendation vide (with a copy to MoEF&CC vide letter dated 04.06.2018 & reminder letter vide dated 4th Jan, 2019). Presentation on the findings of the report was made to GCZMA committee on 4th October 2019 and the recommendation for the same has been received vide email dtd 22nd Sept, 2020 with conditions. Details of the same were submitted as a part of previous half yearly EC compliance report for the period Oct'20 to Mar'21.</p> <p>As a part of GCZMA recommendations and NCSCM mangrove conservation action plan, APSEZ has undertaken following activities.</p> <table> <tr> <th>Sr. No.</th><th>Recommendations</th><th>Compliance</th></tr> <tr> <td>1.</td><td>Mangrove mapping and monitoring in and around APSEZ</td><td> <ul style="list-style-type: none"> APSEZ entrusted NCSCM, Chennai to carry out Monitoring of mangrove distribution in creeks in and around APSEZ and shoreline changes in Bocha island. As a part of this study, overall growth of mangroves in the creeks in and around APSEZ was assessed comparing Google earth images of 2017 & 2019 and it is observed that there was increase in mangrove cover between March 2017 and September 2019 to the extent of 256 Ha, which is about 10.7%. This suggests that the mangroves and the tidal system in the creeks remain undisturbed over this period. Analysis of data between categories indicated that there was an increase in dense mangroves and also conversion of scattered to sparse which also shows that the growth of mangroves in a progressive direction. Hence, there is an overall growth of mangroves in creeks in and around APSEZ, Mundra is 502 Ha between 2011 and 2019. The cost of the said study was INR 23.56 Lacs incurred by APSEZ. </td></tr> </table>	Sr. No.	Recommendations	Compliance	1.	Mangrove mapping and monitoring in and around APSEZ	<ul style="list-style-type: none"> APSEZ entrusted NCSCM, Chennai to carry out Monitoring of mangrove distribution in creeks in and around APSEZ and shoreline changes in Bocha island. As a part of this study, overall growth of mangroves in the creeks in and around APSEZ was assessed comparing Google earth images of 2017 & 2019 and it is observed that there was increase in mangrove cover between March 2017 and September 2019 to the extent of 256 Ha, which is about 10.7%. This suggests that the mangroves and the tidal system in the creeks remain undisturbed over this period. Analysis of data between categories indicated that there was an increase in dense mangroves and also conversion of scattered to sparse which also shows that the growth of mangroves in a progressive direction. Hence, there is an overall growth of mangroves in creeks in and around APSEZ, Mundra is 502 Ha between 2011 and 2019. The cost of the said study was INR 23.56 Lacs incurred by APSEZ.
Sr. No.	Recommendations	Compliance						
1.	Mangrove mapping and monitoring in and around APSEZ	<ul style="list-style-type: none"> APSEZ entrusted NCSCM, Chennai to carry out Monitoring of mangrove distribution in creeks in and around APSEZ and shoreline changes in Bocha island. As a part of this study, overall growth of mangroves in the creeks in and around APSEZ was assessed comparing Google earth images of 2017 & 2019 and it is observed that there was increase in mangrove cover between March 2017 and September 2019 to the extent of 256 Ha, which is about 10.7%. This suggests that the mangroves and the tidal system in the creeks remain undisturbed over this period. Analysis of data between categories indicated that there was an increase in dense mangroves and also conversion of scattered to sparse which also shows that the growth of mangroves in a progressive direction. Hence, there is an overall growth of mangroves in creeks in and around APSEZ, Mundra is 502 Ha between 2011 and 2019. The cost of the said study was INR 23.56 Lacs incurred by APSEZ. 						

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Sr. No.	Conditions	Compliance Status as on 31-03-2023	
		2.	<p>Tidal observation in creeks in and around APSEZ</p> <ul style="list-style-type: none"> APSEZ carried out the tidal observations at locations similar to 2017 in Kotdi, Baradimata, Navinal, Bocha and Khari creeks under the guidance of NCSCM. The observed tidal ranges indicate that the creeks experience normal tidal ranges, adequate for the growth of mangroves. The cost of the said activity was INR 1.0 Lacs.
		3.	<p>Removal of Algal and Prosopis growth from mangrove areas</p> <ul style="list-style-type: none"> Algal and Prosopis growth monitoring was done in and around mangrove area and algal encrustation was found in some of the mangrove areas, which has been removed manually. The cost of the said activity was INR 2.35 Lacs during the FY 2022-23. The details of algal & prosopis removal is attached as Annexure - 8.
		4.	<p>Awareness of mangroves importance in surrounding communities</p> <ul style="list-style-type: none"> Adani Foundation – CSR Arm of Adani group has done awareness camps/activities created in the community regarding importance of mangroves. Celebrated the International Mangrove Day for the Conservation of the Mangrove Ecosystem every year on 26th July. Adani Foundation provides good Quality dry and green fodder to 24 Villages. Project is covering total 14116 Cattles / 3008 farmers and hence enhancing cattle productivity during FY 2022-23. Awareness of mangroves importance in surrounding communities & Fodder support - The expenditure for fodder supporting activities was approx. 200.89 Lacs during FY 2022-23, which was incurred by APSEZ. Individual Fodder Cultivation: Farmers were Aware, Convince and trained to cultivate super Napier Grass as on farm projects to reduce their Fodder Dependency and expense. With that effort 192 farmers have Adopted and Cultivated Super NAPIER Grass in 190-acre area and produce 3800 Fodder Tons Yield annually, lead to save Approx

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			<p>Rs 52 Lacs of farmers.</p> <ul style="list-style-type: none"> • Grass Land development: AF converted 205 acres of denuded village common pastureland gauchar into fertile and productive grassland in Zarpara and siracha village to transform into Fodder Sustain village with Community participation and responsibility for maintain and Monitoring. • Among that 18 Acre of Guchar land is fenced and sowed with Multispecies Green Fodder with Having Good nutritive value More than 2250 Cattle will sustain with Improving quality and Quantity of Milk. • Other than this dedicated security guard with gate system deployed by APSEZ across the coastal area and no unauthorized persons allowed within coastal as well as mangrove areas. • APSEZ has celebrated the International Day for the Conservation of the Mangrove Ecosystem on July 26th to raise awareness of the importance of mangrove ecosystems as "a unique, special and vulnerable ecosystem". The photographs of celebration were submitted in previous compliance period Apr'22 to Sep'22. • Refer CSR report attached as Annexure – 2. <p>Details of activities done as a part of GCZMA recommendations and NCSCM mangrove conservation action plan were submitted as a part of previous half yearly EC compliance report for the period Oct'20 to Mar'21.</p> <p>To comply with the GCZMA recommendations regarding mangrove monitoring at every 2 years, APSEZ earlier awarded work order to NCSCM, Chennai vide order no. 4802018994, dated 29/07/2022 with cost 23.77 Lacs for mangrove mapping in and around APSEZ, but due to some financial disputes and no proper response from NCSCM side regarding resolution, the work order has been revoked.</p> <p>After that as suggested by Joint Review Committee in its report that mangrove related studies may be undertaken by different agencies on a rotation basis for a better</p>

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		review of the mangroves, APSEZ issued work order to the Gujarat Institute of Desert Ecology (GUIDE), Bhuj vide order no. 4802027981, dated 10/04/2023 for mangrove mapping in and around APSEZ, Mundra. The cost of said work is 23.60 Lacs (Including Taxes), which will be paid by APSEZ.
8	The GAPL shall take up massive mangroves plantation activities in addition 25 Ha. of area suitably identified in consultation with the office of the Principal Chief Conservator of Forests, GoG , as well as this Department. The GAPL shall bear the cost of the said land as well as the cost of the plantation of mangroves & its sustenance for a reasonable period of time.	<p>Complied.</p> <p>Construction activities are completed & project is in operation stage. Please refer to specific condition no 1 of the compliance of EC and CRZ clearance for detailed reply regarding mangrove plantation activity.</p>
9	In addition to the mangroves plantation, the GAPL shall also take up massive greenbelt development in and around the project site in consultation with the Forest Department.	<p>Complied.</p> <p>Construction activities are completed & project is in operation stage. Please refer to specific condition no 2 of the compliance of EC and CRZ clearance for detailed reply regarding greenbelt development activity.</p>
10	The GAPL shall provide financial contribution as	Complied.

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	many as decided by this department for any common study like carrying capacity for the Gulf of Kachchh as well as for any common facilities including Vessels Traffic Management System in the Gulf of Kachchh, for the purpose of the environment protection/management.	<p>APSEZ is practicing well defined traffic control procedure.</p> <p>A VTMS service for Gulf of Kutch is provided by the VTS Gulf of Kutch, operated by Directorate General of Lighthouses and Lightships (DGLL), Govt. of India.</p> <p>Marine Control of APSEZ provides traffic update to vessels in Mundra Port Limit on VHF Channel- 77.</p> <p>Arrival and departure information before arrival and departure respectively in Gulf of Kutch is provided to VTMS information cell through agent or by directly sending mail to vtsmanagergulfofkutch@yahoo.com and vtsgok@yahoo.com</p> <p>Mundra port has subscribed and taking VTMS feed from Kandla from link www.vts.gov.in.</p> <p>Necessary financial contribution if require will be provided on hearing from MOEF&CC.</p>
11	The GAPL shall provide financial support in implementation of National Green Corps scheme (being implemented in Gujarat by the GEER Foundation) in Kachchh district in consultation with Forests & Environment Department.	<p>Complied</p> <p>Necessary contribution if require will be provided on hearing from GEER foundation to support NGC scheme.</p>
12	The GAPL shall bear the cost of the external agency that may be appointed by the Forests and Environment Department, GoG for supervision/ monitoring of their activities during construction and/or operational phases.	<p>Point noted.</p> <p>APSEZ will provide full support for supervision and monitoring of the project operations after due discussion with the concerned agency and Forests & Environment Department, GoG. No such agency was appointed during the compliance period.</p> <p>As part of the directions given by MoEF&CC vides order dated 18th Sep, 2015, following studies were conducted.</p> <p>1. NCSCM (MoEF&CC promoted Government Agency) study on comprehensive and integrated plan for preservation and conservation of mangroves and associated creeks in and around APSEZ in year 2016-17.</p>

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		<p>The cost of said study was 3.15 Cr, which was incurred by APSEZ.</p> <p>As a part of mangrove conservation plan, APSEZ has done following activities.</p> <ol style="list-style-type: none"> Monitoring of mangrove distribution in creeks in and around APSEZ and shoreline changes in Bocha island through NCSCM, Chennai. The cost of the said study was INR 23.56 Lacs incurred by APSEZ. Tidal observation in creeks in and around APSEZ – The cost of the said activity was INR 1.0 Lacs incurred by APSEZ. Algal & Prosopis removal from Mangrove area - The cost of the said activity was INR 2.35 Lacs during the FY 2022-23. The details of Removal of Algal and Prosopis growth from mangrove areas is attached as Annexure – 8. Awareness of mangroves importance in surrounding communities & Fodder support - The expenditure for fodder supporting activities was approx. 200.89 Lacs during FY 2022-23, which was incurred by APSEZ. This activity is being done on continuous basis as a part of CSR activity. During current FY 2022-23, the expenditure for fodder supporting activities was approx. 200.89 Lacs. <p>To comply with the GCZMA recommendations regarding mangrove monitoring at every 2 years, APSEZ earlier awarded work order to NCSCM, Chennai vide order no. 4802018994, dated 29/07/2022 with cost 23.77 Lacs for mangrove mapping in and around APSEZ, but due to some financial disputes and no proper response from NCSCM side regarding resolution, the work order has been revoked.</p> <p>After that as suggested by Joint Review Committee in its report that mangrove related studies may be undertaken by different agencies on a rotation basis for a better review of the mangroves, APSEZ issued work order to the Gujarat Institute of Desert Ecology (GUIDE), Bhuj vide order no. 4802027981, dated 10/04/2023 for mangrove mapping in and around APSEZ, Mundra. The cost of said work is 23.60 Lacs (Including Taxes), which will be paid by</p>

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		<p>APSEZ.</p> <p>2. A Regional Impact Assessment study through Chola MS, Chennai (NABET accredited consultant) to identify impacts of all the existing as well as proposed project activities in Mundra region inline to ToR issued by GCZMA. The cost of said study was 1.3 Cr, which was incurred by APSEZ.</p>
13	The dredged material that may be generated, if any, shall be disposed of at location suitably identified in consultation with the institute of repute like NEERI/NIO after due consideration of various environmental aspects and ensuring no significant negative impacts due to the same.	<p>Complied.</p> <p>Construction activities are completed & project is in operation stage. SPM is approximately 8.6 km inside the open sea from the shore where 30 m of draft is naturally available. Hence no dredging is required.</p>
14	No waste including the construction debris, oily waste from construction equipment's, untreated sewage, etc. would be disposed of in to sea/ river/ creek or in the CRZ areas. The treated sewage meeting with the norms fixed by the Gujarat Pollution Control Board and the reject water from RO plant if any, shall be disposed of at a point in the deep sea as may be suggested by the institute of repute like the NEERI/NIO.	<p>Complied.</p> <p>Construction activities are completed and the project is in operation phase.</p> <p>There is no disposal of any waste including civil debris in CRZ area.</p> <p>No Sewage or RO Reject water is being generated by SPM activity.</p>
15	The Gujarat Maritime Board shall ensure that the Vessel Traffic Management System for safe navigation in the Gulf of Kachchh shall	<p>Complied.</p> <p>Kandla, GMB & DGLL are the agencies who financially support to VTMS. For SPM, APSEZ is mutual partner to support in case of Oil spill & vice versa. For further details</p>

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	be established and commissioned before commissioning of the SPM No. 1 by the GAPL. The GAPL shall follow up for this with various stakeholders and provide financial and technical inputs for the same.	regarding traffic management, please refer condition no. 10 of CRZ recommendations above.
16	A mutual aid system for the Mundra Port region shall be developed to meet with any unforeseen circumstances or to meet with any accidental condition. The GAPL shall take a lead for this by involving other stakeholders including HPCL.	<p>Complied.</p> <p>APSEZ has signed an MoU with HPCL, Mittal Pipeline Ltd., Mundra in the region of Gulf of Kutch to assist each other within stipulated time frame with best combination of resources.</p> <p>Interface with ROSDCP and NOSDCP For responding to oil spill, the Indian Coast Guard has developed the National Oil Spill Disaster Contingency Plan NOSDCP which has the approval of the Committee of Secretaries and has been in operation since 1996. The NOSDCP brings together the combined resources of the various organizations and departments, Coast Guard, Ports and Oil handling Agencies, and related industries, to provide a level of preparedness to the threat posed to the marine environment by oil spills.</p> <p>Latest Regional Level Pollution Response exercise "SWACHCHH SAMUDRA-NW 2022" was carried out by Indian Coast Guard on 12th April, 2022 at Vadinar, Gujarat. All participants from various Oil Handling Agencies and Stakeholders (ICG, RELIANCE, ESBTL, OOCL, APSEZ, BORL, VOTL (NAYARA) were participated in this exercise. Details of the same were submitted during the last compliance period Apr'22 to Sep'22.</p>
17	A detailed Risk Assessment and Disaster Management Plan shall be worked out before commissioning of the SPM by the GAPL and the mitigative measures shall be identified and implemented. The local Oil Spill Contingency Plan in	<p>Complied.</p> <p>Detailed Risk Assessment and Disaster Management Plan were prepaid By Tata AIG risk assessment services and few mitigation measures are addressed in compliance of specific condition no 10 of EC & CRZ clearance above. These studies were carried out before the start of the development activity and were considered by MoEF&CC before grant of the EC and CRZ clearance.</p>

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Status of the conditions stipulated under CRZ Recommendation		

Sr. No.	Conditions	Compliance Status as on 31-03-2023
	lines with the National Oil Spill Disaster Contingency Plan for the Mundra Port shall be put in to operation immediately.	For responding to oil spill, the Indian Coast Guard has developed the National Oil Spill Disaster Contingency Plan NOSDCP which has the approval of the Committee of Secretaries and has been in operation since 1996. Oil Spill Contingency Response Plan (OSCRP) is prepared in accordance with the NOSDCP. Please refer specific condition no 5 of EC & CRZ clearance for further details.
18	Proper rehabilitation scheme shall be worked out for local fisherman communities in consultation with the District Collector/the Commissioner of Fisheries, Government of Gujarat, before commissioning of the SPM and report shall be furnished to the Forests and Environment Department.	Not applicable Location of SPM is unmanned (approximately 8.64 km inside the open sea from the shore) hence, there is no displacement of people, houses or fishing activity as a result of the project. However, APSEZ performs large scale socio-economic upliftment program and shares the details with FOKIA (Federation of Kutch Industries Association) chaired by District Collector quarterly. For further information related to CSR activities carried out by Adani Foundation in the Mundra region, please refer to compliance of General condition no. 2 of the EC and CRZ clearance above.
19	The construction labour shall be provided with adequate amenities/facilities including the water supply, sanitation and fuel to ensure that the existing environmental condition is not deteriorated by them. The camps for the construction labour shall be kept outside the CRZ area. The GAPL shall ensure that there is no confrontation amongst the local villagers and construction labour.	Complied. Construction activity is already completed, project is in operation phase. No construction camps were located in CRZ area. Most workers came from nearby villages however, for others; construction camps were located outside CRZ area. All necessary infrastructure and facilities like mobile toilets, safe drinking water, medical health care etc. were provided.
20	All possible social and health impacts due to the proposed development at Mundra Port shall be	Complied. Aspects of social and health impact were studies as part of EIA report prepared by NIO and mitigation measures have been implemented.

	Adani Ports and Special Economic Zone Limited, Mundra.	From : Oct'22 To : Mar'23
Status of the conditions stipulated under CRZ Recommendation		

Sr. No.	Conditions	Compliance Status as on 31-03-2023
	assessed in detail in the comprehensive EIA and a detailed management plan shall be developed to mitigate the same.	APSEZ performs large scale socio-economic upliftment program and shares the details with FOKIA (Federation of Kutch Industries Association) chaired by District Collector quarterly.
21	The GAPL shall work out a detailed socio-economic upliftment programme in consultation with the District Collector and District Development Officer and shall implement the same. Separate budgetary provisions shall be kept for this purpose.	For further information related to CSR activities carried out by Adani Foundation in the Mundra region, please refer to compliance of General condition no. 2 of the EC and CRZ clearance above.
22	An Environmental Management Cell with person having proper background shall be constituted. A separate budgetary provision shall have to be made for implementation of the Environmental Management Plan.	<p>Complied.</p> <p>APSEZL has a well-structured Environment Cell, staffed with qualified manpower for implementation of the Environmental Management Plan. For further details on the same, please refer to compliance of general condition no. 4 of the EC and CRZ clearance above.</p> <p>Separate budget for the Environment Protection measures is earmarked every year. For further details on the same, please refer to compliance of general condition no. 5 of the EC and CRZ clearance above.</p>
23	Post project environmental monitoring shall be carried out regularly through a reputed institute like NEERI/NIO and report shall be submitted to the Forests and Environment Department, GoG every year.	<p>Being complied.</p> <p>Monitoring of various environmental parameters for Ambient Air, Noise, marine water and sediments is being carried out by NABL accredited and MoEF&CC approved agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi.</p> <p>Ambient Air Quality (twice in a week) and Noise (once in a month) monitoring are being carried out by NABL and MoEF&CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. Summary of the same for duration from Oct'22 to Mar'23 is mentioned below.</p> <p>Total Ambient Air & Noise Sampling Locations: 4 Nos.</p>

	Adani Ports and Special Economic Zone Limited, Mundra.	From : Oct'22 To : Mar'23
Status of the conditions stipulated under CRZ Recommendation		

Sr. No.	Conditions	Compliance Status as on 31-03-2023					
		Parameter	Unit	Min	Max	Average	Perm. Limit [§]
		AAQM					
		PM10	µg/m3	62.18	89.79	80.06	100
		PM2.5	µg/m3	21.25	49.12	35.29	60
		SO2	µg/m3	11.24	36.28	25.71	80
		NO2	µg/m3	16.78	43.65	33.20	80
		Noise	Unit	Leq Min	Leq Max	Leq Avg.	Leq Perm. Limit*
		Day Time	dB(A)	58.20	69.80	64.75	75
		Night Time	dB(A)	54.20	64.50	59.93	70
		[§] as per NAAQ standards, 2009 [*] as per CC&A granted by SPCB Values recorded confirms to the stipulated standards.					
		Marine water monitoring is carried out on monthly frequency. In order to analyzed marine water quality, marine sampling is being carried out at a location nearby SPM. Please refer specific condition No. 8 of EC & CRZ clearance above.					
		Environmental monitoring reports for the period from Oct'22 to Mar'23 are enclosed as Annexure – 3 .					
24	No construction activities shall be carried out by the GAPL in any of the Forest areas.	Already Complied. Not applicable at present. The construction work is completed and project is in operation phase. No construction activity at any of the forest area is carried out for project of SPM, COT and connecting pipeline.					
25	All necessary clearances from different Government Department/Agencies shall be obtained before commissioning any construction activities.	Complied. All necessary clearances as per prevailing laws have been already obtained. Construction activity is already completed, project is in operation phase.					

Status of the conditions stipulated under CRZ Recommendation

Sr. No.	Conditions	Compliance Status as on 31-03-2023																					
26	A half yearly compliance report with respect to above mentioned conditions as well as the implementation of the suggestions/ recommendations of the EIA and Risk Assessment reports shall be furnished to the Forest and Environment Department, GoG, without fail at regular interval.	<p>Complied.</p> <p>Compliance report of EC conditions is uploaded regularly. Last compliance report including results of monitoring data for the period of Apr'22 to Sep'22 was submitted to Integrated Regional Office (IRO) @ Gandhinagar, Zonal Office of CPCB @ Baroda, GPCB @ Gandhinagar & Gandhidham and Dept. of Forests & Env., Gandhinagar vide our letter dated 21.11.2022. Copy of the same is also available on our web site https://www.adaniports.com/ports-downloads. A soft copy of the same was also submitted through e-mail on 30.11.2022 to all the concern authorities. Please refer below for the details regarding past six compliance submissions.</p> <table border="1"> <thead> <tr> <th>Sr. No.</th><th>Compliance period</th><th>Date of submission</th></tr> </thead> <tbody> <tr> <td>1</td><td>Oct'19 to Mar'20</td><td>20.05.2020</td></tr> <tr> <td>2</td><td>Apr'20 to Sep'20</td><td>26.11.2020</td></tr> <tr> <td>3</td><td>Oct'20 to Mar'21</td><td>25.05.2021</td></tr> <tr> <td>4</td><td>Apr'21 to Sep'21</td><td>30.11.2021</td></tr> <tr> <td>5</td><td>Oct'21 to Mar'22</td><td>30.05.2022</td></tr> <tr> <td>6</td><td>Apr'22 to Sep'22</td><td>30.11.2022</td></tr> </tbody> </table> <p>All the recommendations given in the report of Tata AIG Risk Management Services are implemented. For further information related to the same, please refer to compliance of specific condition no. 10 of the EC and CRZ clearance above.</p>	Sr. No.	Compliance period	Date of submission	1	Oct'19 to Mar'20	20.05.2020	2	Apr'20 to Sep'20	26.11.2020	3	Oct'20 to Mar'21	25.05.2021	4	Apr'21 to Sep'21	30.11.2021	5	Oct'21 to Mar'22	30.05.2022	6	Apr'22 to Sep'22	30.11.2022
Sr. No.	Compliance period	Date of submission																					
1	Oct'19 to Mar'20	20.05.2020																					
2	Apr'20 to Sep'20	26.11.2020																					
3	Oct'20 to Mar'21	25.05.2021																					
4	Apr'21 to Sep'21	30.11.2021																					
5	Oct'21 to Mar'22	30.05.2022																					
6	Apr'22 to Sep'22	30.11.2022																					
27	The GAPL shall also have to comply with any other condition as may be stipulated by the Forests and Environment Department, GoG, from time to time.	Point noted.																					

Annexure – 1

Details of Greenbelt Development at APSEZ, Mundra

	Total Green Zone Detail till Up to March 2023				
LOCATION	Area (In Ha.)	Trees (Nos.)	Palm (Nos.)	Shrubs (SQM)	Lawn (SQM)
SV COLONY	72.29	34920.00	7962.00	69696.00	100646.00
PORT & NON SEZ	81.61	149359.00	19220.00	75061.78	62966.38
SEZ	115.70	226120.00	20489.00	220583.60	28162.03
MITAP	2.47	8113.00	33.00	3340.00	4036.00
WEST PORT	104.29	248074.00	66816.00	24112.00	16369.00
AGRI PARK	8.94	17244.00	1332.00	5400.00	2121.44
SOUTH PORT	14.45	27530.00	3470.00	3882.00	3327.26
Samundra Township	58.26	63722.00	11834.00	23908.89	47520.07
Productive Farming (Vadala Farm)	0.00	0.00	0.00	0.00	0.00
TOTAL (APSEZL)	457.99	775082.00	131156.00	425984.27	265148.18
		906238.00			

Details of Mangrove Afforestation done by APSEZ

Sl. no.	Location	District	Area (Ha)	Duration	Species	Implementation agency
1	Mundra Port	Kutch	24	-	Avicennia marina	Dr. Maity, Mangrove consultant of India
2	Mundra Port	Kutch	25	-	Avicennia marina	Dr. Maity, Mangrove consultant of India
3	Luni/Hamirmora (Mundra)	Kutch	160.8	2007 - 2015	Avicennia marina, Rhizophora mucronata, Ceriops tagal	GUIDE, Bhuj
4	Kukadsar (Mundra)	Kutch	66.5	2012 - 2014	Avicennia marina	GUIDE, Bhuj
5	Forest Area (Mundra)	Kutch	298	2011 - 2013	Avicennia marina	Forest Dept, Bhuj
6	Jangi Village (Bhachau)	Kutch	50	2012 - 2014	Avicennia marina	GUIDE, Bhuj
7	Jakhau Village (Abdasa)	Kutch	310.6	2007-08 & 2011-13	Avicennia marina, Rhizophora mucronata, Ceriops tagal	GUIDE, Bhuj
8	Sat Saida Bet	Kutch	255	2014-15 & 2016-17	Avicennia marina & Biodiversity	GUIDE, Bhuj
9	Dandi Village	Navsari	800	2006 - 2011	Avicennia marina, Rhizophora mucronata, Ceriops tagal	GEC, Gandhinagar
10	Talaja Village	Bhavnagar	50	2011-12	Avicennia marina	Forest Dept, Talaja
11	Narmada Village	Bhavnagar	250	2014 - 2015	Avicennia marina	GEC, Gandhinagar
12	Malpur Village	Bharuch	200	2012-14	Avicennia marina	SAVE, Ahmedabad
13	Kantiyajal Village	Bharuch	50	2014-15	Avicennia marina	SAVE, Ahmedabad
14	Devla Village	Bharuch	150	210-16	Avicennia marina	SAVE, Ahmedabad
15	Village Tala Talav (Khambhat)	Anand	100	2015 - 2016	Avicennia marina	SAVE, Ahmedabad
16	Village Tala Talav (Khambhat)	Anand	38	2015 - 2016	Avicennia marina	GEC, Gandhinagar
17	Aliya Bet, Village Katpor (Hansot)	Bharuch	62	2017-18	Avicennia marina & Rhizophora spp.	GEC, Gandhinagar
18	Kukadsar- (Bhadeswar- Mundra)	Kutch	250	2021-22	Avicennia marina	Shreeji Enterprise, Amreli
19	Kukadsar- (Bhadeswar- Mundra)	Kutch	750	2022-23	Avicennia marina	Shreeji Enterprise, Amreli
Total			3890			

Annexure – 2

Annual Report 2022-23

CSR Kutch

Adani Foundation

Adani House, Port Road, Mundra – Kutch 370 421
[info@adanifoundation.com] [www.adanifoundation.com]



Our Journey by Mr. Rakshit Shah Executive Director APSEZ

The year 2022-23 has passed off with motivation through recognition by ASSOCHAM for health care awards which shows courage to work for the commitment given to the community. It is necessary that sustained growth is achieved at rural level along with the industrial development. This can be made possible by involving more and more people in the rural development programme.

Since beginning, The Adani Foundation Mundra is committed to the cause of the deprived and underprivileged. It has been working relentlessly across 6 Talukas, covering 92 villages, to uplift the lives of more than 60,000 families with a multi-faceted approach.

This year conceded with more streamline and scalable project of Education i.e. Utthan – to enhance primary education of 70 schools of Mundra including 8 High Schools, milestone achievement in Fisherman amenities project by Providing skill and livelihood to 34 fisherfolk youth, 225 Homebiogas with partnership approach with objective to reduce chemical fertilizer usage in seven villages of Mundra , considerable impact created by Mangroves Biodiversity projects and new era defined in agriculture projects i.e. Super Napier, dates offshoots and Dragon Fruit Cultivation

Gram Bharti has proved a benchmark platform for Self help groups at PAN India which is true support with promoting skill & sustainability. Massavie Tree plantation drive “Vriksh Se Vikas” initiated with aim of plantation 1 Lac Trees in Mundra Taluka in upcoming year.

Jyoti ben Tank – one of the best women farmer of Mundra awarded by “Amazing Indian Award by Vice President of India”. District Animal Welfare Department recognized Adani Foundation for best contribution during Lumpy outbreak.

The people of Kutch have generously supported the activities carried out by the Adani Group or else this wouldn't have been possible. Their determination, understanding and commitment have strengthened the development even more.

Our Achievement would not be possible without the ultimate support by Mr. Gowda (COO, AF), Mr. V S Gadhvi, Executive Director – AF, Ms. Shilin R Adani (Managing Trustee) **and generous faith and passionate support by Dr. (Mrs.) Priti G Adani, Chairperson- Adani Foundation**

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CSR KUTCH

Demographic Details

Block	Villages	No. of HHs	Population
Mundra	61 Village and 9 Fishermen Vasahat	35192	153179
Anjar	3 Villages	4350	18500
Nakhtrana	8 Villages	4093	16373
Bite – Abdasa	12 Villages	2415	9660

1. Adani Ports and SEZ Limited
2. Adani Power Mundra Limited
3. Adani Wilmar Limited
4. Adani Wilmar – Caster Limited
5. Kutchh Copper Limited
6. Mundra Solar Panel Making Unit
7. Green to PVC Mundra Limited
8. Adani Kandla Bulk Terminal Port Pvt Limited
9. Adani Solar Limited – Bitta, Abdasa
10. Adani Green Energy Limited – Nakhatrana
11. Adani Cementation Limited – Lakhpat
12. Adani Transmission Limited – Mandvi

ENVIRONMENT SUSTAINABILITY PROJECTS



ENVIRONMENT SUSTAINABILITY

Environmental sustainability is the responsibility to conserve natural resources and protect global ecosystems to support health and wellbeing for present and future. These components are closely interrelated and mutually re-enforcing Under Corporate Environmental responsibility.

To make connections between human actions Environment & biological diversity found within a habitat and/or ecosystem, Adani Foundation executing various Project i.e. massive tree plantation drive, Mangroves, biogas provision, forest development and drip irrigation

Biodiversity conservation: to preserve biodiversity and Natural Resources.

Regenerative capacity: Protect the depletion of natural resources and keep the harvest rate of renewable resources within the capacity of regeneration.

Environment Sustainability Projects : Ensuring ecological balance, protection of flora and fauna, terrestrial and coastal species conservation, welfare, agro forestry, conservation of natural resources and maintaining quality of soil, air and water



REDUCING CARBON FOOTPRINT

1. Miyawaki – Nana Kapaya

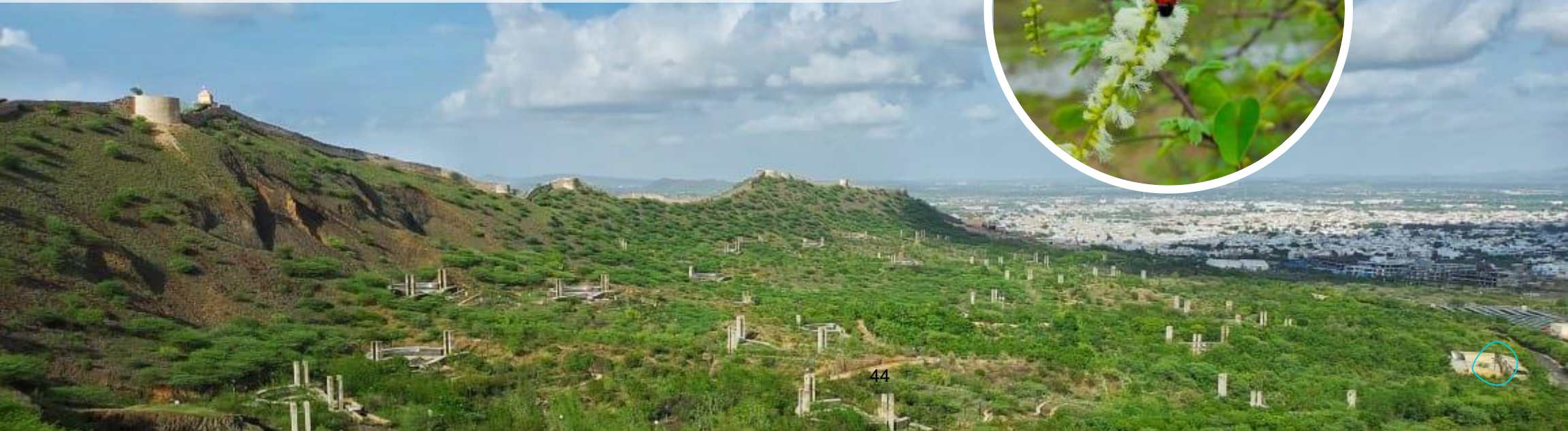
Miyawaki- Dense Plantation is developed in year 2021-22 at Nana Kapaya Village in 2.0 acre land. Miyawaki plot is very close to sewage water tank so watering to plantation by the same. From current year GP has taken ownership for monitoring and watering.

Plantation of 5880 saplings of different 42 species is completed which will result in dense forest due to good rain this year.

2. Smritivan Memorial park– Bhuj

The memorial will occupy around 406 acres of space of the Bhujia Dungar near Bhuj, Kutch that will show people's oppressive response to a natural disaster.

Adani Foundation has supported for 47000 saplings in Smriti van @ 100 Lacs INR.



REDUCING CARBON FOOTPRINT

With a vision to Enhance the diversity of mangrove and its associated species in suitable coastal region of Kachchh, which in turn would enhance the faunal diversity and fishery resources of the area by providing suitable habitats and breeding ground. The ultimate aim of the project is to improve overall coastal biodiversity of the region which in turn assist in improving the livelihood of the coastal populace

Total five mangrove species, such as *Ceriops*, *Aegiceras* and *Rhizophora* were selected which in turn enhanced the dependent faunal diversity of the area. Thereby, there will be an increase considerable biodiversity of the area. **The initial pilot trails were undertaken in an area of approximately 16 hector during the period between 2019 and 2023 with the active participation of local communities.** Current year 4 Hector plantation is in progress which will be resulted in 20 Hector Mangroves Biodiversity Park within one year

S. NO	Mangrove Associate	Life form
1	<i>Suaeda</i> Spp.	Herb
2	<i>Porteresia coarctata</i>	Herb
3	<i>Opuntia elatior</i>	Shrub
4	<i>Sesuvium portulacastrum</i>	Herb
5	<i>Ipomoea biloba</i>	Climber
6	<i>Salvadora persica</i> L.	Shrub
7	<i>Urochondra setulosa</i>	Herb



REDUCING CARBON FOOTPRINT

Home biogas is the Israel based company was founded in 2012 manufactures dynamic biogas unit not only for farm waste but for kitchen waste too. Under Gram Utthan Project, Adani Foundation is supporting home biogas to farmers periphery Villages.

Promotion of Natural Farming–Home biogas And Improving the health and living conditions for the millions of families that are still cooking on charcoal and wood. Adani Foundation is not only supporting but creating awareness to save environment and health of the community who regularly cooking on Chula. **It is proven that one hour cooking on Chula is as dangerous as smoking 40 cigrates.**

Till date 225 farmers are utilizing it with satisfaction and considerable outcome by saving Average Rs. 23,400 for gas and fertilizer as well – with Economic benefit of Rs. 52.65 Lacs.

100 Farmers are linked up with Gobardhan Yojana in which DRDA is providing Biogas with Rs. 5000 Contribution. Adani Foundation has worked as a facilitator between DRDA and Beneficiaries farmers in filling and submission of forms. Total 325 farmers are supported with Biogas as sustainable environment protection



4,176 TONS OF ANIMAL MANURE TREATED

359,687 HOURS OF CLEAN COOKING;

9.3 TONS OF BIOGAS CREATED

325 TONS OF FIREWOOD REPLACED;

47,375 HOURS SAVED ON REDUCTION OF
FIREWOOD & COLLECTION

1225 TONS CO2 EMISSION REDUCTION



Reducing organic waste + Transitioning to renewable energy + Motivation for reduction in use for fertilizer

REDUCING CARBON FOOTPRINT

5. Water Conservation Project - CSR

Since 10 years considerable Water Conservation Work carried out in Mundra Taluka. Due to satisfactory rain in current year 1.11 mtr ground water table increased in coastal belt of Mundra as per Government Figures. Our water conservation work is as Below.

- Large number of water harvesting structure (18 Nos. of check dams in coordination with salinity department) and Augmentation of 3 check dams
- Ground recharge activities (pond deepening work for 61 ponds) individually and 26 ponds under Sujlam Suflam Jal Abhiyan were built leading to a significant increase in water table and higher returns to the farmers
- New Pond Deepening Under Ajadi ka Amrut Mahotsav done in Goyarsama village. Approx Deepening Capacity is 12000 Cum.
- Roof Top Rain Water Harvesting 145 Nos. **(40 Nos current year)** which is having 10,000 litre storage which is sufficient for one year drinking water purpose for 5 people family.
- Recharge Bore well 208 Nos which is best ever option to direct recharge the soil
- Drip Irrigation approx. 1505 Farmers benefitted in coordination with Gujrat Green Revolution Company till date
- Bund construction on way of Nagmati River could save more than 575 MCFT water quantity which recharged in ground due to which bore well depth decreased by 50-100 Ft in Zarpara, Bhujpur and Navinal Vadi Vistar.
- **Check dam gate valve construction at Bhujpur which controlled more than 350 MCFT water to go into sea and get recharged current year.**
- **Pond Pipe line work at Prasla Vistar Zarpara which increase recharge capacity more than 25% in 100 hector area.**



REDUCING CARBON FOOTPRINT

- **Impact**

- 218500 men, women, children, and elderly impacted by this initiative.
- Total Dissolved Solids (TDS) in the ground water down by 16.7%.
- Ground water table up by 4.2 ft. over the last 5 years.
- In four villages water levels have increased by 15-20 ft. through bore-well recharging facility
- Storage capacities of check dams and ponds increased by 106.44 MCFT. Total area benefited 2857 hectares.
- Annually 10000 Liters of water saved and up to INR 10000 saved per family.
- 80% reduction in money spent on labour.
- Up to 20% less money spent on electricity bills.
- 50% less water used as compared to conventional methods.
- Potable water available at doorstep. Earlier on an average women used to walk 1.3 kms to fetch water.
- On an average there has been up to 25% decrease in expenses on healthcare.
- Water availability has also ensured safety, security and overall well-being of women and children in the area.
- Initiatives and efforts made under water projects by Adani Foundation continues to provides sustainable solutions for community for their improved farming and ease of living.



Water conservation and Management

Process Flow for Rooftop Rain Water Harvesting System



Social Survey & TDS mapping



Community Contribution



RRWHS



Impact

- Portable water at door step
- Cost saving for portable water
- Improved water quality with
- Creates water conservation awareness in rural community
- Improves standard of living of rural community

Total RRWHS :- 145

RRWHS Constructed in 2022-23 :- 40

Population Impacted :- 500+

Savings per household :- 10000+

TDS difference between Ground water and RRWHS water



REDUCING CARBON FOOTPRINT

6. Tree Plantation

Till the date 70,540 Tree have been planted at various Public places , Schools, GP and crematorium with their responsibility to nurture and maintain regularly.

For this passionate work our team Member Mr. Karshan Gadhvi was Felicitated with Van Mitra Award by Forest department and GOG.

Adani Foundation has planted 1100+ fruit bearing trees at Bhujpur and 2100+ neem, pipal and native spices at Dhrub in coordination with District Forest Department and community with partnership approach



EDUCATION

EDUCATION



PROJECT UTTHAN



PROJECT UTTHAN

The Adani Foundation set out an innovative intervention in year 2018–19 through project Utthan to improve students' learning capabilities, provide facilities to schools to improve environment and achieve better learning outcomes at the grassroots level with the help of Utthan sahayak. This extensive intervention involves adopting government primary schools, tutoring Priya Vidyarthi's (progressive learners), introducing English as a Third Language, with various academic activities as well co-curriculum activities to end the dropout rates, and working together for staff capacity building. In order to improve children' basic literacy and numeracy skills, it has also engaged the help of educators and parents, especially mothers.

Key Aspect of Project Utthan

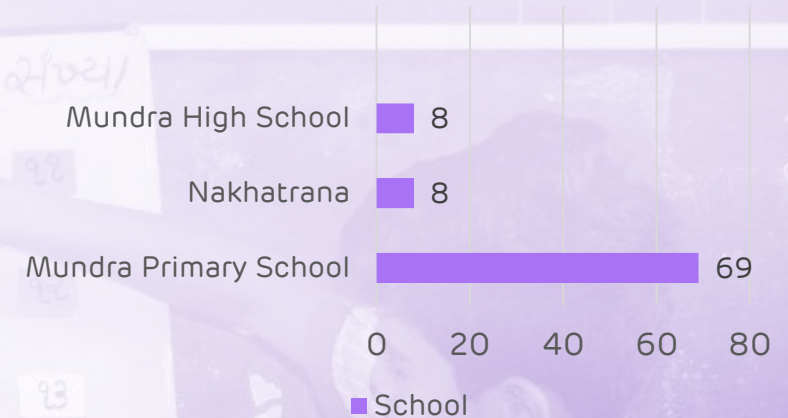
- ✓ Adopting government primary schools.
- ✓ Main streaming Progressive learners
- ✓ Enhancing Learning Outcomes
- ✓ Arresting dropout rates
- ✓ Introducing English as a Third Language
- ✓ Enabling Joyful Learning Spaces
- ✓ Collaborating for teachers' capacity building

Gunotsav is a quality enhancement initiative of the Government of Gujarat for bringing about improvement in learning levels of students at Elementary level

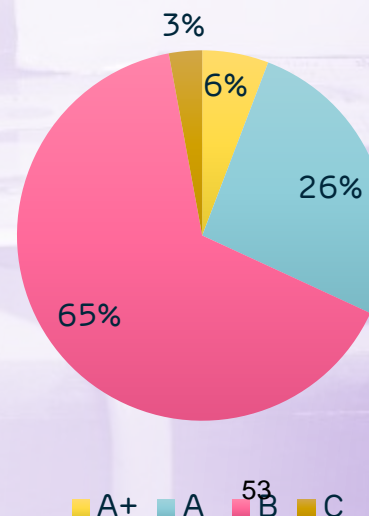
Assessment is based on four core areas :

- ✓ Teaching learning outcomes
- ✓ School management
- ✓ Co-Scholastic activities
- ✓ Usage of resources.

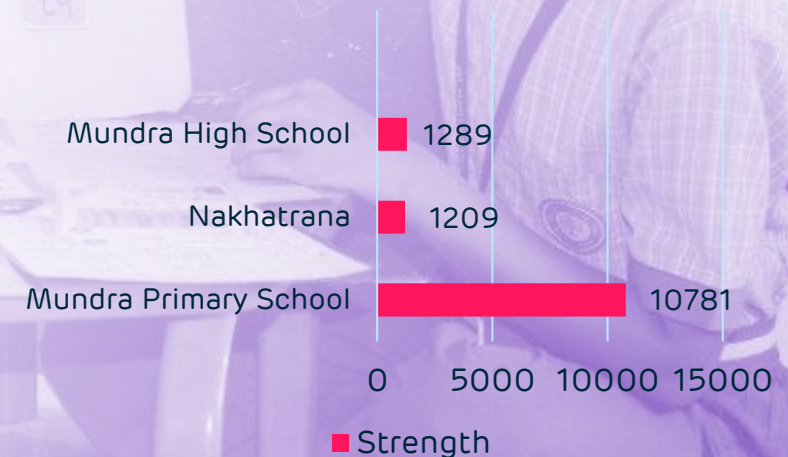
Utthan Schools in Kutch



Gunotsav 2021-22 (Kutch) : An Affirmation on Utthan Schools



No's of Students in Kutch



PROJECT UTTHAN



Conduct baseline assessment of 7034 Students, 3364 Students were progressive learner, 1403 Students mainstreamed.

Location	Total Strength	Baseline Assessment	Progressive learner	Mainstream Students
Mundra	10799	6047	3029	1247
Nakhatrana	1267	987	335	156

Facilitating English from Classes 1-4 : 7500 + are taking the advantage of this intervention.

Cultivating Reading Culture

Introduced DEAR (Drop Everything and Read) period on every first and third Saturdays for an hour; Library activities on every Second & fourth Saturdays.



Year 2020-21

22890 books

Year 2021-22

60780 books

Year 2022-23

110205 books

PROJECT UTTHAN



IT on Wheels : 2 Dedicative Van, 55 Laptops Empowering 2620 Students of 5-8 Std. In Gujarat

IT on wheel program is run to teach them basic emphasizes elementary school digital literacy. In early schooling is the first step to addressing access disparities in this evolving digital environment which is not feasible for rural students. Customize basic syllabus impede their development.

Day Celebration every Month : Summer Camp & Diwali Mela in Vacation

Every month Utthan sahayak celebrates day in which encourage students to

participate in co-curriculum Activity which create opportunity to learn and experience new things. Also planned 15 days Summer camp & 10 days Diwali mela during vacation. 2800+ students participated with more than 4000 handmade traditional products, 3500+ footfalls during exhibition cum sale. Diwali mela attracted 7363 students. That included 12 Activities, 28529 Total Expenses & 37529 earn students. Sarpanch, SMC members, Mothers, and Parents all take part enthusiastically.

Competitive exam Preparation

Location	JNV	NMMS	PSE
Mundra	227	324	347
Nakhatrana	23	48	48

500+ Mothers meet with 11000+ Mothers

Every month, on the Fourth Saturday, Utthan Sahayaks conduct Mothers meets. A child grows a most during the first few years of school, when both the mother and the teacher are crucial in developing their character and personality. Many of the kids are first-generation learners with uneducated parents; in these circumstances, Mother's Meet encourages mothers and teachers in working together to support the education of the child. Also, mothers get a sense of empowerment and value and regularly updates on school activities. Recreational activities during the meeting add an element of surprise and rejuvenation among the Mothers.



PROJECT UTTHAN

International School Library Month (ISLM)

ISLM (International School Library Month) was celebrated by 69 Utthan schools. And school from Russia joined with us in zoom to engage under the virtual connection around the world.

Students from Samaghogha School No.1 performed Garba, while students from Vandh school gave information about library activities. Bookmarks' & Digital bookmarks were distributed with partner schools. This is continuing, 3rd time Utthan schools participated in ISLM.

Signed MoU with 18 more Government Primary Schools at Mundra

Signed MoU with 8 Government High Schools : 8 Village 8 High Schools, 2 Adani Education Evening Center

To overcome challenges of High schools and improve the quality of education, Utthan appointed 2 Utthan sahayak at High schools. 1 for Science/Math's & 1 for English as most of the students facing problems in this subjects. Utthan organized a Parents Teachers Meeting at 8 schools in 8 villages, there were over 450 parents gathered.

After school, children get the opportunity to study at three levels at the Adani Education Evening Center. (AEEC) Remedialcoaching.



Project Title	Participation of Utthan School	Partner Schools	Partner Countries
Bookmark	51	63	08
Digital Bookmark	37	78	10
Virtual Connection Around the World	10	10	09
Total	98	151	27

PROJECT UTTHAN

Utthan's outreach strategies to Increase children's learning

- ✓ Project Utthan has been studied and selected as 'University Practice Connect' by Azim Premji University, Bengaluru.
- ✓ Project is in alignment with NIPUN Bharat (National Initiative for Proficiency in Reading with Understanding and Numeracy Bharat Program) & FLN (Foundational Literacy & Numeracy)
- ✓ Navneet e-Sense software updated in all schools.
- ✓ 100 hours capacity building programs for Utthan sahayak and school Teachers. specially focusing on Foundational Literacy and Numeracy. Utthan sahayak attend CBP (Capacity building program) once in every month.
- ✓ 100% participation in 100 days reading campaign.
- ✓ Google Map : All Utthan schools added in Google map. Utthan sahayak upload photos continuously. that's uploaded Photos got 200k+ views.
- ✓ Utthan sahayak create content for Reading, Writing & Numeracy.
- ✓ Utthan sahayak create 150 Worksheets on Yoga In the run-up to India's 75th Independence day celebrated across India's Azadi Ka Amrit Mahotsav. The tour covers 75 heritage, tourist and archaeological sites and landmark architectural sites across Gujarat.
- ✓ Utthan Sahayak, Hetalba Vaghela encouraged students from Mokha Primary School to write the story. Saptahik Phulwadi, Ahemdabad published the story written by student.
- ✓ TLM, Sports, Music & Science kit distributed to create joyful environment.
- ✓ Inter school competition organized to encourage physical activity & develop talent.
- ✓ Utthan sahayak encouraged & trained students in various competition organized by GoG.



EDUCATION PROJECT

Adani Vidya Mandir, Bhadreshwar



EDUCATION: FREE AND COMPULSORY - vision of Adani Foundation to provide cost-free education, food, uniform, books to the children of economically challenged families of Mundra Bock. Adani Vidya Mandir, Bhadreshwar was established in June 2012, with aim of uplifting the communities through education. The school is equipped with excellent infrastructure and resources required for all-round development of the student. The child is given admission in class 1 and is molded to be an educated and a good human being by experienced and compassionate teachers. The school follows a curriculum designed by GSEB. **507 underprivileged students of Fisherman & Maldhari communities from 8 villages benefitted costfree education at the school**

Teachers Day Celebration with facilitation of all teachers and awarded 5 best teachers in academics. District Education Officer Mr. Prajapati graced the occasion and motivated the staff.

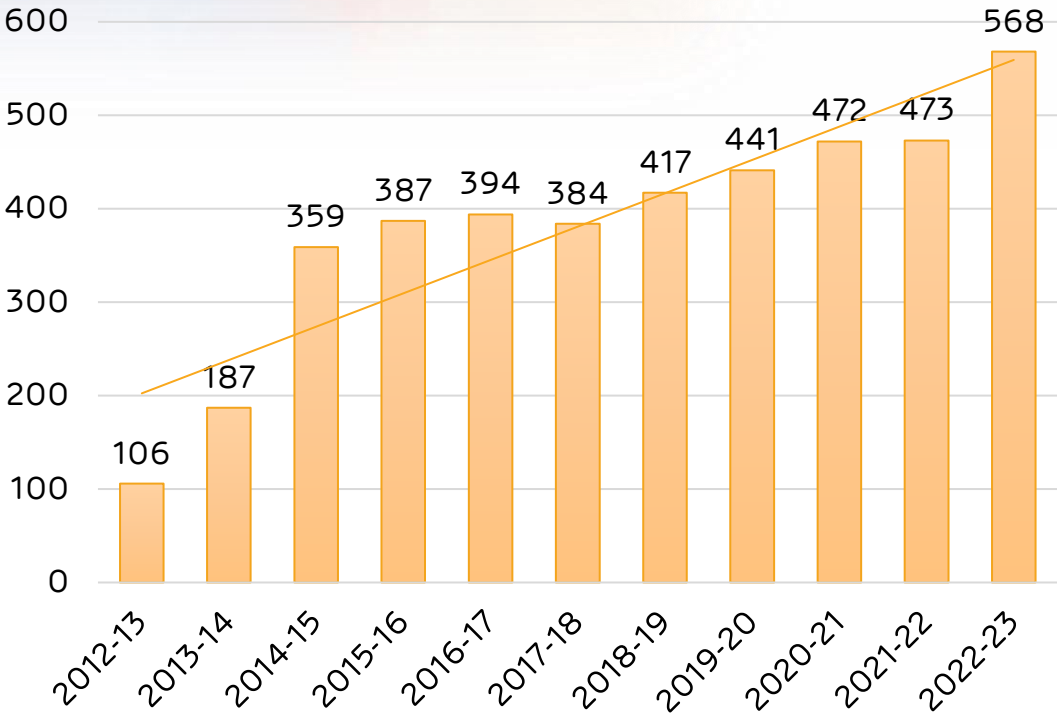
ADANI VIDYA MANDIR, BHADRESHWAR



milestone achievement of Adani Vidya Mandir Bhadreshwar Gujrat Board Standard 10th Examination Result is 100%.

- The grand celebration of the year 2022-23 at AVMB was Shri Gautam Adani sir's Birthday.
- Promoting the harmony across all communities, Special Assemblies are conducted on a regular basis where all the Festivals irrespective of the religion & following are fondly celebrated.
- Periodical assessments and evaluations are conducted for the students and their progress are informed to the parents frequently.

Total Strength



Adani Vidya Mandir Bhadreshwar		
2021-22 (10 th Board)		
NO	GRADE	STUDENTS
1	Above 80 %	3
2	60-80%	18
3	40-60%	10
	TOTAL	31
	Result	100%

PROJECT UDAAN

Vision : To create a pool of inspired young mind

Mission : To motivate young students to dream big



Udaan is a special project inspired by the life changing story of Mr. Gautam Adani. As a child, he had visited the Kandla port in Gujarat, and after looking at the expanse of the port, he dreamt of having his own port one day. The rest is history. Under this project exposure tours are organized where school students are given a chance to visit the Adani Group facilities such as Adani Port, Adani Power and Adani Wilmar refinery at Mundra to get an insight into the large-scale business operations and thus get inspired to dream big in life. The exercise stimulates the young minds to dream big and help them become entrepreneurs, innovators and achievers of tomorrow, and thus play an active role in the process of nation building

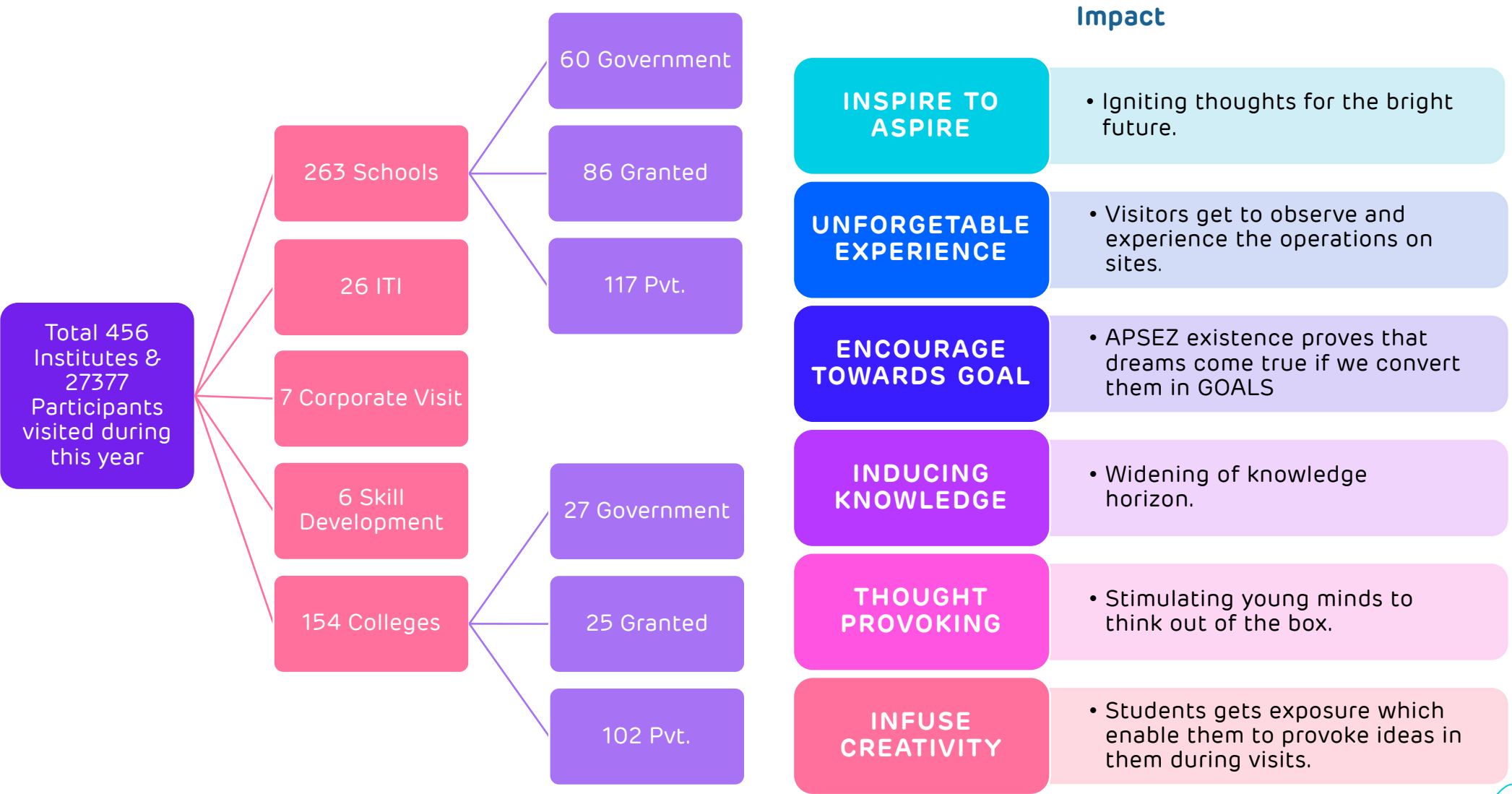
Adani Foundation, Udaan Project invited the members of self-finance School Association, Gujarat for an exposure visit. 90 participants were facilitated with extraordinary experience of Port, Power, Wilmar and Solar plants visit.

Under Project Udaan total revenue generation is Rs.218.77 lacs.



PROJECT UDAAN

Dashboard Sustainable project revenue generated



SUSTAINABLE LIVELIHOOD DEVELOPMENT



SUSTAINABLE LIVELIHOOD DEVELOPMENT

The Pashudhan & Preventive Health care management

Program is a revolutionary initiative by Adani Foundation to provide support and aid to farmers in managing their cattle's health and nutrition needs. The program aims to bring about a positive change in the lives of farmers of Mundra ,who heavily rely on their livestock for income and sustenance.

One of the key components of the Pashudhan Program is providing fodder support to farmers, especially during periods of drought or crop failure. Adani Foundation provides good Quality of dry and green fodder which covered 14116 Cattle of 24 Villages / 3008 farmers. This Program help them to feed their cattle with good quality of fodder that meets all nutritional requirements which increase the productivity of livestock and improve their overall health. In turn, this has resulted in increased income for farmers and improved food security for families.

In addition to this, we also focuses on farmers training for effective cattle health management techniques and Vaccination Drive as prevention measures.



SUSTAINABLE LIVELIHOOD DEVELOPMENT

Grass Land development

AF converted 205 acres of denuded village common pastureland (gauchar) into fertile and productive grassland in Zarpara and siracha village to transform into Fodder Sustain village with Community participation and responsibility for maintain and Monitoring.

Among that 18 Acre of Guchar land is fenced and sowed with Multispecies Green Fodder with Having Good nutritive value. More than 2250 Cattle will sustain with Improving quality and Quantity Of Milk.

Average 2450 cattle get benefitted by green fodder for 72 days –which increase 0.5 litre milk quantity of 50% cattle.

$(1225 \text{ cattle} \times 0.5\text{-liter milk quantity Increase} \times 40 \text{ INR per liter} = \text{Rs.}1592000)$.

Apart that Open grazing Benefit save farmer cost to purchase Fodder . $(2450 \text{ cattle} \times 7\text{kg} / \text{Day} \times 72 \text{ Days} = \text{Rs. } 37,04,400 \text{ (Rs. } 3 \text{ per kg)})$

This Intervention could save Rs.52,96,400.00

It would be highlighted as best Demonstration and replicate in the other villages as sustainable fodder development project.

Individual Fodder Cultivation

Farmers were Aware ,Convince and trained to cultivate super Napier Grass- as on farm projects to reduce their Fodder Dependency and expense. its update Variety of grass and Can be harvested three time in year with Good growth and Nutritive Value. With that effort 192 farmers have Adopted and Cultivated Super NAPIER Grass in **190-acre area and produce 3800 Fodder Tonnes Yield annually, lead to save Approx. Rs.52 Lacs of farmers.**

SUSTAINABLE LIVELIHOOD DEVELOPMENT

Cattle health camp

Adani Foundation and Animal Husbandry department Veterinary Jointly organizing cattle health Awareness and vaccination programs in 24 Villages of our periphery villages. A cattle health camp typically involves a team of Government veterinary Doctor who provide check-ups and treatments for common ailments and remaining Medicines and Vaccine was provided by AF

Program is very effective to maintaining the optimal health of livestock and help to protect the cattle from deadly diseases such as Foot-and-Mouth Disease (FMD) and Clostridial infections. The vaccines used in these programs are specifically designed to provide long-lasting immunity against specific diseases, ensuring that the animals remain healthy even in harsh environmental conditions.

Total 17299 cattle of 19 Villages had benefitted With different kind of medicines and vaccines.

Apart that 973 camels kharai camels were vaccinated with fitodas and Antisaras in the Phulai-Chhari Dhandh area of Nakhtrana taluka.



Lumpy Disease Vaccination Drive.

An effective and Immediate step was taken to Mitigate lumpy Skin disease outbreak in the Kutch In co-ordination of District Animal Husbandry department through Vaccination and awareness drive at grass Root level. Total 40,000+ cattle were covered through therapeutic and ayurvedic treatment and Nutritive Cattle feed Support.

SUSTAINABLE LIVELIHOOD DEVELOPMENT

Bovine brucellosis is a chronic infectious disease of cattle that causes abortion, the birth of weak or dead calves, infertility and, as a consequence, reduced milk production. Cattle and buffaloes of all ages are susceptible, and infection can persist for many years.

This disease is also zoonotic (a disease that can be transmitted from animals to people)
Hence to protect Cattles against Bovine Brucellosis AF Started Awareness and vaccination program with Kutch fodder fruit & Forest development trust (KFFT) in our 11 Villages.

Under this project following activities were carried out,

- Meeting with Gram Panchayat, Farmers and Livestock Owners
- Development and Distribution of the Awareness Materials among the stakeholders
- Mass Level awareness by pasting the poster and meetings with Village Gram Panchayat's
- Primary Survey and Sample Collections i.e. , Milk Ring Test, Blood Collection and testing
- Brucella Vaccination and Ear Tagging etc. Brucellosis Control Project 2020 Cumulative Progress of various important

No	Name of Activity	2020-21	2021-22	2022-23	Total
1	Awareness Meetings	19	23	18	60
2	Milk Ring Test	48	11	34	93
3	Blood Sample Collection	29	23	18	70
4	Vaccination	2132	2951	2970	8053
5	Family Covered (Direct)	287	379	484	1150
6	Total Benefited (in Direct) Families	1435	1895	2420	5750



Promotion of Natural Farming

Natural farming is a method of agriculture that prioritizes soil health and sustainability. Instead of relying on synthetic fertilizers and pesticides, one key aspect of natural farming is the use of cow-based preparation like Jivamrut, Gau Krupa, Amrutam, and wormy Compost Fertilizers.

Adani Foundation Promote Farmers to adopt Cow based farming with end to End Program from Awareness to Market Linkage. 1392 farmers benefitted by training from which 60% farmers chemical usage is reduced to half extent in 500 Acres approximately.

Impact

- I. Production Cost- 20% Reduced
- II. Chemical & pesticide exposure- 30 to 40% Reduced
- III. Premium product price-5% increase
- IV. Crop Yield & Taste - Better taste and quality-

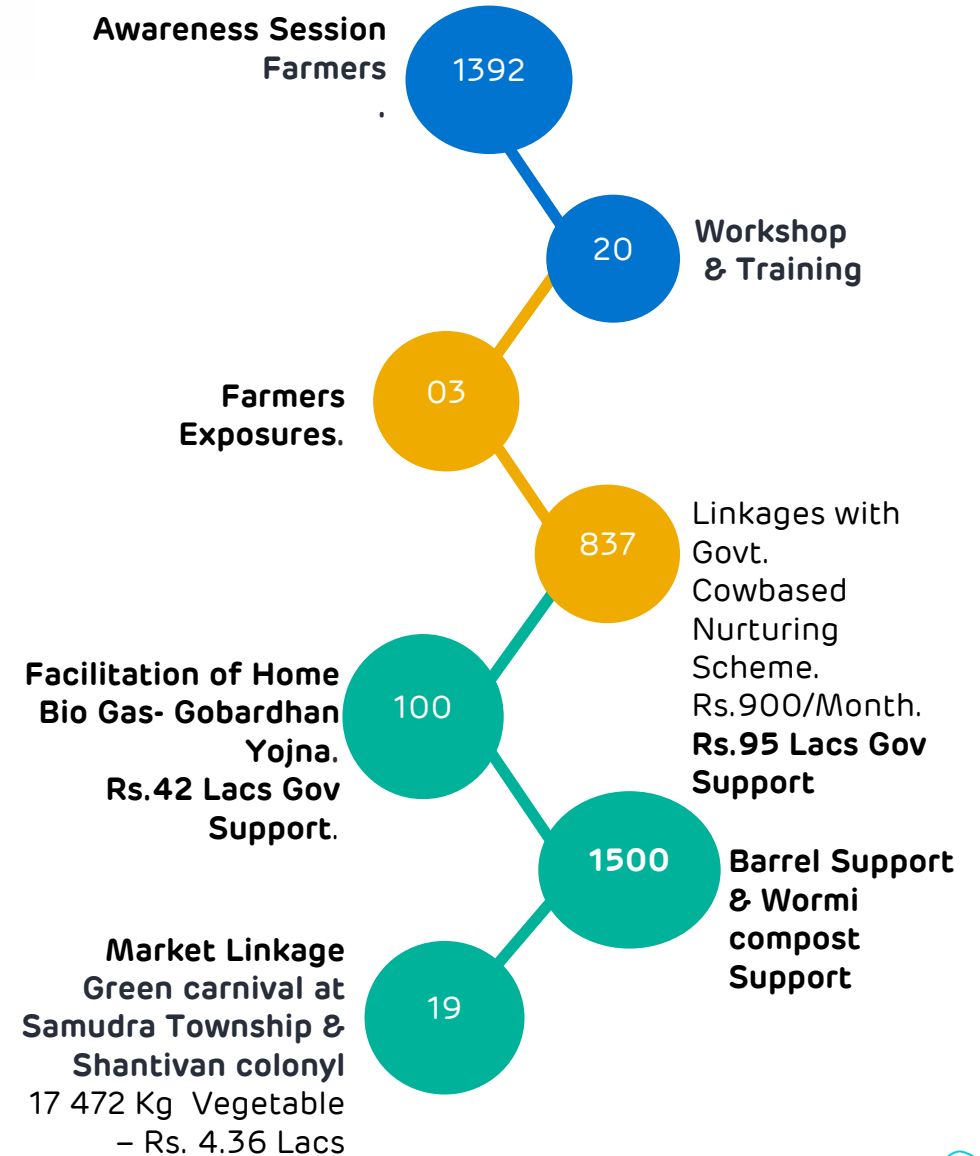


SUSTAINABLE LIVELIHOOD DEVELOPMENT



Natural Farming

Implementation Process of Projects



SUSTAINABLE LIVELIHOOD DEVELOPMENT



Prakrutik Sahkari Mandli

Formation of Shree Raj Shakti Prakrutik Kheti sahkari Mandali Limited Mangara and register Under Gujarat Co-operative Society act-1961 with 60 Members which is the First Organic Company of Registered across Kutch.

AF Started an Initiatives **"Green carnival"** an initiatives to Provide Marketing Platform to farmers to sell Natural Farming Vegetable & Agri Produce at Shantivan and Samdudra town Ship ,Mundra on Weekly base.

We provides resources, and technical assistance to help farmers to market their products successfully.

Farmer's Producer Organization

Kutch Kutch Kalpaturu Producer Entity (KKPC) was established in the year 2020 to address the interests of farmers, particularly to provide an entrance for outputs and inputs. The company was founded with 237 farmers

KKPC served for Date Packaging box, Milk Supply to Colonies, NB 21 Off suits Supply, Vegetable Seed ,Mineral Mixtureand Cattle feed supply and plan to extend more service.

KKPC Current Year turnover is. Rs.28.89 lacs by started Different Kind of Initiatives



SUSTAINABLE LIVELIHOOD – FISHERFOLK COMMUNITY



Access of Pre-primary
education.to 3 Vashat –
125 Students



Transportation Facilities to Govt.
& AVMB School- 33 Students



Free AVMB –School Education -
147 Students



Book Support -43 High School
Students



Scholarship Support -43
Students of SMJ School Luni



Coaching for 10th Exam OF 8th
.9th Failed Students -28
Students

**Fisherfolk education has
had a significant impact on
communities to shaping
individuals' lives By
providing Access of quality
education for Pre- primary
to Higher Education.
More than 500+ Fisherfolk
children are getting
Education**

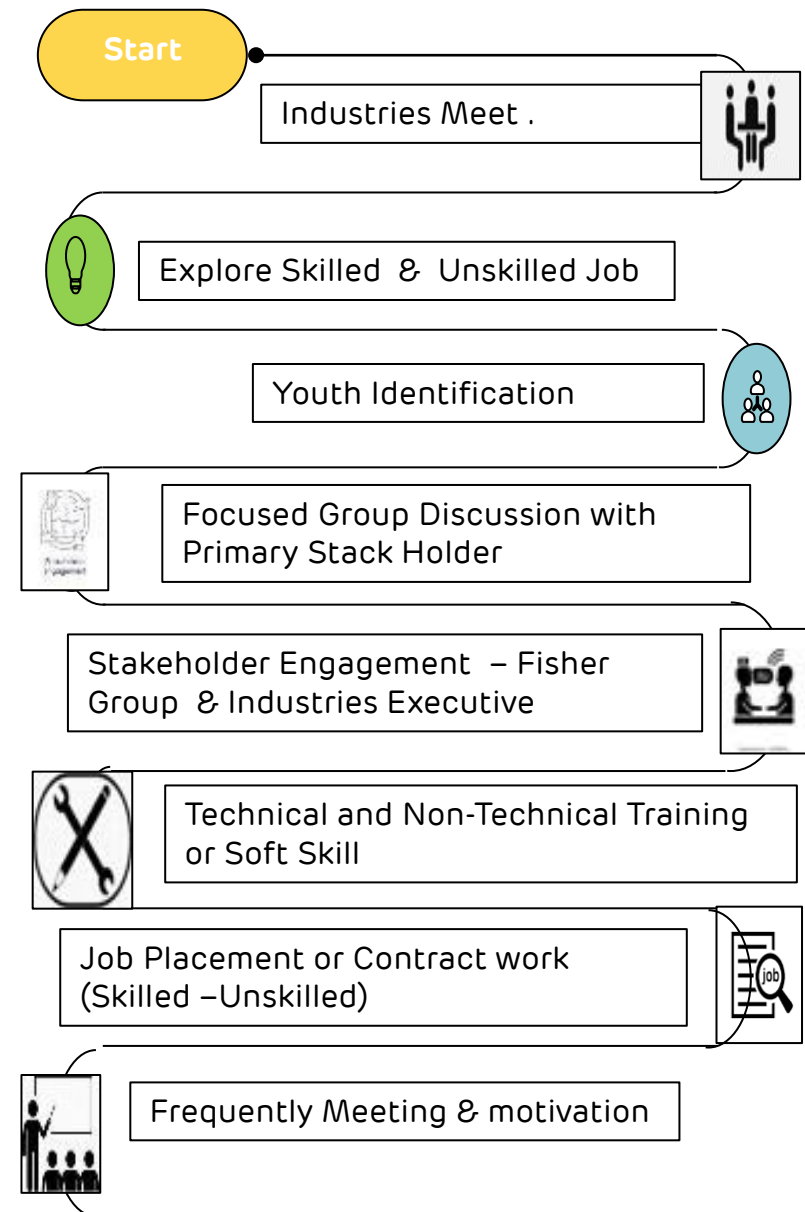
Impact

1. Access Of Quality Education
2. Promoting Girl Child Education.
3. Increase Economic Productivity
4. Creating Employment Opportunity
5. Social Development & Networking

SUSTAINABLE LIVELIHOOD DEVELOPMENT

- ❖ 194 fishermen and women are engaged through Contract adani Group Company on regular base.
- ❖ 23 Youth have been Placed in Different company after Completion of Technical training.

Total 217 Fisherfolk are Employed and earning on Monthly Base.
Average Monthly Income Rs.14500/ Individual



SUSTAINABLE LIVELIHOOD DEVELOPMENT

Fisherfolk Livelihood

Mangrove plantation and Nursery development work has created a two facet impact by providing Livelihood to Fisherfolk during two months Fishing during Off season and developing 162 hector dense mangrove afforestation. **5200 Men days** work provide to **285 Fisherfolk** of Luni ,Sekhdiya and Bhadreshwar Villages in coordination with Horticulture Det.

Formed **Sagar Saheli SHG of** Navinal Fisherfolk Women and Linked With DRDA after completion of Stitching Training ,received first order of Rs.80,000 to prepare Cotton Bags. Total 12 Women are engaged and planning to expand with more Women and Order. Liaising with Fisheries department to Facilitate Fishermen welfare Scheme and Form Filling Process. Pagdiya Fisherfolk Kit, Boat Licence renewal, Boat Token Process.



WOMEN EMPOWERMENT PROJECT

Women are essential to the entire development process, whether in a single household, a village, a state, or a nation. Adani Foundation provides a platform for Community women to overcome the social barriers by becoming change - makers in their communities and societies while maintaining their traditions. Mundra has witnessed a significant shift in the development of women beneficiaries in various fields of occupation including such agriculture, self-employment, horticulture, and so on. The Adani Foundation has a strong emphasis on strengthening rural women and betterment through sustainable livelihood support, resulting to socioeconomic shifts in the rural population.

WOMEN EMPOWERMENT PROJECT

Strategy & Process of Empowering Women by SHG Group

Identification of target Group

Mobilization and formation

Capacity building & Training

Saving & Credit Activity

Income generating Activities

Connect with Government & other organization

Monitoring & Evaluation

Adani Foundation has been working towards empowering women through various programs and initiatives. Here is a brief overview of our work in women empowerment :

- ✓ **Self Help Groups (SHGs)** : We have established 82 self-help groups in various rural and urban areas to provide financial and social support to women. We provided training and capacity building workshops to members of these SHGs to help them develop income-generating activities and improve their livelihoods. Through this initiative, we have empowered over 850 women to become self-reliant with Savings of Rs. 30.42 Lacs
- ✓ **Training & Skill Development** : We conducted skill development programs for women in various fields such as tailoring, handicrafts, and food processing. These training programs helped women develop their skills and start their own businesses. We have trained over 320 women in various skills, and many of them have started their own businesses.
- ✓ **Women's Health** : We organized several health camps and awareness programs for women, with a special focus on menstrual Hygiene. These programs aimed to educate women about their health and empower them to make informed decisions. We provided health services to over 1150 women through these camps.
- ✓ **Assistance in Job & Government scheme** : We empower 256 women by help them to seek Job, they all earn average 9288/- Monthly. Also Gave awareness about government scheme which directly benefit to woman & helped them in the process to apply.
- ✓ **Advocacy and Awareness** : We conduct awareness campaigns and advocacy programs to promote gender equality and women's rights. We aim to challenge the social norms and cultural practices that prevent women from achieving their full potential.

WOMEN EMPOWERMENT PROJECT

1. 56+ women by Gram Bharati Platform

2. 102 + Menstrual Hygiene workshops

3. 12+ Advocacy and Domestic violence sessions

4. 82 SHG - Saving & Credit Activity

5. 220 + Job Placement



WOMEN EMPOWERMENT PROJECT

SHG Name	Our Intervention	No. of Woman	Get Order from	Order of	Total Order (lac)	Grambharati (lac)	Till today Turnover
Jyot Saheli Swa Sahay Juth	Collaboration with RSETI & trained woman by Rural Self Employment Training institute	10	Mundra Navratri Celebration	Moti work, Bead work neckless as well as Panjo	0.42	0.75	1.17
Saheli Swa Sahay Juth	Help them for tender process	10	Jilla Mahila ane Bal Adhikari Kutch,Bhuj	Sanitary Pad	1.20	0.00	2.50
Tejashvi Saheli Swa Sahay juth	Help them to increase variety in stitching related work, Wall Hangings, folder bag, Uniform	15	AVMB – Bhadreshwar	Uniform, Folder bag,Jatt bag	9.12	1.10	20.25
Food Sister Saheli group	Help them to start the Canteen at Rangoli Gate	10	APSEZ + Rangoli Driver Shed	Food	3.00	0.00	3.50
Shradhha Saheli	Tender from ATMA + Various ordered of Food + Snacks provided to various Balvadi	10	ATMA, Adani Public school & Balavadi	Lunch + snacks	8.63	0.20	15.00
Meghadhanush Saheli	organized an exhibition of Eco-friendly Ganpati	11	Utthan Project	Mud frames	1.39	0.60	12.00
Radhe Saheli Swa Sahay Juth	Exhibition cum sale & Inspire them to participate in Grambharti	16	Gram bharati order	various type of Dhadaki	0.40	0.20	2.00
Sonal Saheli Groups	Training them for Making Phynial & Washing Powder	10	Port & Wilmar	Sale washing powder	3.60	0.00	12.00
Karimbhai Mansuri	Namda Craft				1.80	0.00	9.80
Over All Corporate	Marketing & Gift packing Training	35	corporate order	Various order from all SHG	9.76		9.76
Total	-	127	-	-	39.32	2.85	87.98

WOMEN EMPOWERMENT PROJECT

Training, Awareness programs, Exhibition and Certificate courses can play a critical role in the development of women by providing them with the skills, knowledge, and resources they need to succeed in their personal and professional lives. Adani foundation is providing that opportunity to rural women by

exposure. This initiative more than 500 woman trained in subject like how to run business, Personal hygiene, Woman rights, social media marketing etc. 30 Women got the Artisan card though the RSETI (Rural self Employment Training Institutes) Adani foundation celebrated International women's by

motivating 150 Woman from different 82 SHG's. Current year theme was **Digital ALL : Innovation & technology for gender equality.**



Community Health

Access to quality healthcare is a fundamental right of every individual

Health plays a crucial role in transforming people's lives. We all realized importance of health after facing challenging situation during Pandemic. Access to quality health care gives a fair chance to lead healthy, productive lives. Healthy people can utilize opportunities available to them.

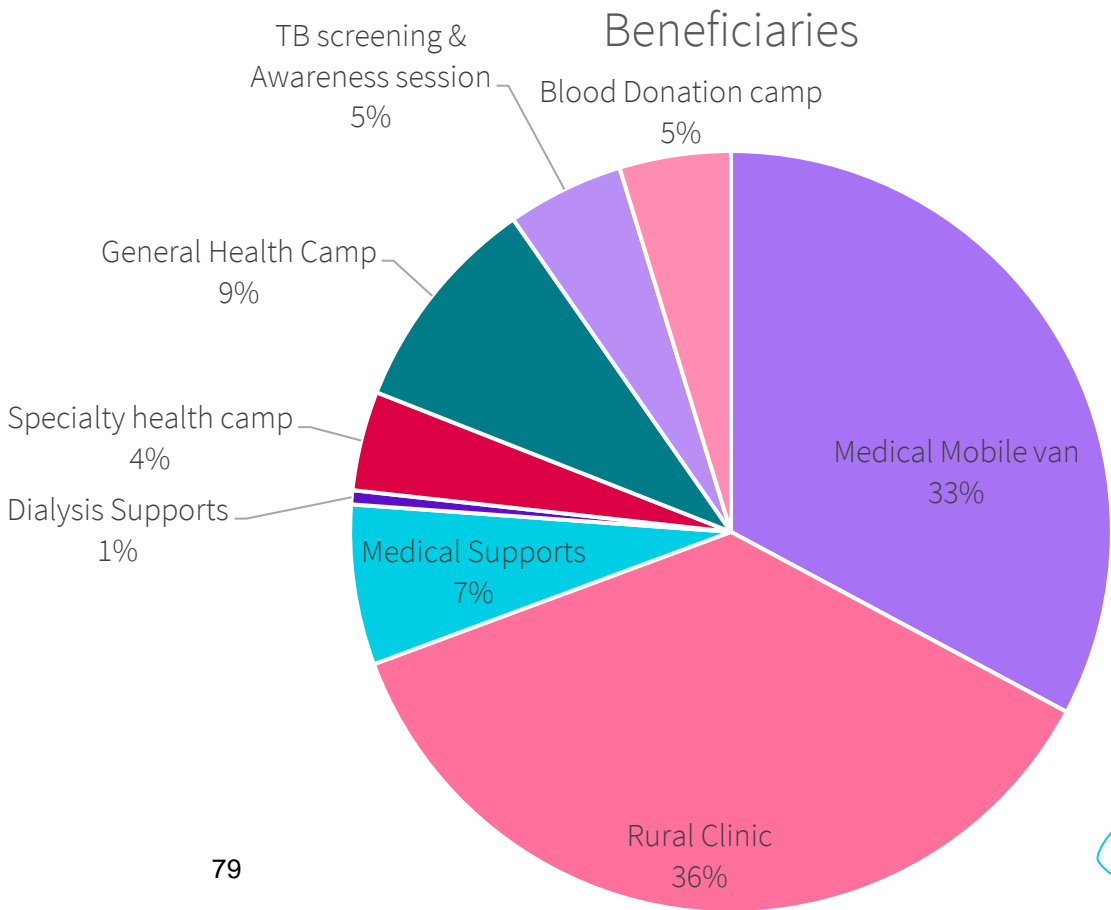


Community Health

Sr. No.	Project	Beneficiaries	
1	Medical Mobile van	11879	32 village
2	Rural Clinic	13209	9 village
3	Medical Supports	2460	63 village
4	Dialysis Supports	216	63 village
5	Specialty health camp	1527	
6	General Health Camp	3379	
7	TB screening & Awareness session	1795	
8	Blood Donation camp	1710	
Total		36175	

“Healthy mind remain in healthy body which create health community to make healthy Nation.”

Adani Foundation is relentlessly working to Provide access of quality health facilities at Doorstep level to create health Society for healthy nation development through various kind of health Projects



Community Health

Rural Clinic & Mobile Health Care unit

Adani Foundation focuses on ensuring good health for better contribution to growth and progress. During this pandemic situation health is the basic need for development of community. Their objective is to live healthier lives by promoting healthcare seeking behavior.

Mobile Health Care Units and Rural Clinic Services are deployed with the objective of providing basic healthcare facilities to remote rural areas as well as poor peoples. The service is being executed by Adani foundation is to reduce travel time, hardships and expenses.

The mobile health care unit covers 25 villages and 07 fishermen settlements. Around 90 types of general life saving medicines are available in these units. This service becomes a boon for women, elderly and children as the service is available at their doorstep.

Rural Dispensaries are established where there is a gap in the healthcare services. The Adani Foundation operates Rural Dispensaries in 6 villages of Mundra block, 02 villages of Anjar block and 1 clinic in Mandvi Block. Mobile dispensary and rural clinics provide health services with token charge of 20/- rupees per patient daily by a doctor and a volunteer.

During this year total 11879 beneficiaries were benefitted by Mobile van and total 13209 beneficiaries were benefitted by Rural clinics where female ratio is 65%.



Community Health

Medical Support Detail

Adani Foundation provides primary health care and financial assistance to needy poor people for ailments such as kidney related problems, paralysis, cancerous and tumor surgeries, neurological and heart problems, blood pressure, diabetes etc.

Partial Medical Support had been given to 2000+ beneficiaries of Mundra, Mandvi and Anjar Block at Adani hospital, Mundra. where as in the Critical cases after stable them we refer them to GKGH, BHUJ for further treatment.

Dialysis Support

The drinking water of Mundra contains high TDS (Total Dissolved Solids). Hence, the proportion of patients with urinary stones and kidney failure is more. Patients suffering from kidney-related diseases require regular dialysis which is costly and adds to the financial burden of the family.

Hence, the Foundation has undertaken a programme to providing dialysis treatment to help the extremely needy patients to live a healthy life. During this

year, 4 patients were supported for regular dialysis (twice a week) with partial support.

NCD Awareness and Prevention

MHCU and Rural Clinic Doctors are working parallelly for creating awareness and prevention measures for Non Communicable diseases, Awareness sessions scheduled in 8 High Schools and 2 community places. More than 110+ patients were supported and counselled for Hypertension and Diabetes. Due to early intervention their life span increased and quality of life became better

Machhimar Shudhh Jal Yojana

To reduce water born disease and women drudgery to get water, Potable water is provided to the fishermen communities at different vasahat through water tanker since 9 years. Coordination done with Gujrat Water Infrastructure Limited For Juna Bandar, Kutadi Bandar, Veera Bandar and Ghavar Bandar. Adani foundation is supporting to 3 fisherfolk settlements.



COMMUNITY INFRASTRUCTURE DEVELOPMENT

The Adani Foundation's Community Infrastructure Development (CID) program is the keystone initiative focus on improving infrastructure facilities of rural and urban area with proper designing and implementation to built robust infrastructure, This project impacted Thousand of life toward health care, education, agriculture, water and sanitation and other basic facilities for sustainable rural development



COMMUNITY INFRASTRUCTURE DEVELOPMENT



40
Construction
Of RRWHS

19 Bore
Recharge

2 Pond
Deepening
under SSJY

Pond
Beatification -
Bund
Strengthenin
g at Bhujpur

2 Percolation
Bore
Recharge

3 Re-
strengthening
of Approach
Road

Cricket
Ground at
Hatdi

Construction
of house for
needy
fisherman

3
Construction
of Water Tank
at Luni
Bandar

Construction
Common
gathering
open shed

Renovation
Approach
Road

4 Common
gathering
Open Shed

Construction & Development, Repairing & Maintenance and Support Work covered during the year

Community
Training
center
Shekadiya

Vegetable
Market at
Mundra

Development
of Gate Valve
at Checkdam

School
Compound
wall at Rampar

Fisherman
approach
Road
restoration

Bund Strengt-
hening at
Bhujpur

2 Pond
Deepening -
Azadi ka
Amrut
Mahotsav

Renovation
Training
center Mundra

Renovation
Blood storage
Lab CHC
Mundra

2 Disable
Widow Toilet
Block

2 CC Road of
700 mtr.

R.O. Plant
Mokha 1000ltr
/HR

JCB & Hitachi
Support for
Pre-Monsoon
Activity

Check dam Re
-
strengthening
Bharudiya

Pond Pipeline
work 800 Mtr

Flood Water
Control Sluice
Gate at
Zarpara

Construction & Development, Repairing & Maintenance and Support Work covered during the year

CRC MUNDRA

Community Resource Center

Community resource Center is the bridge between Government Schemes and real Beneficiaries. It is situated at Adani Field Office, Baroi with the motive to be **Single window point solution (Online Application & Documentation) to Facilitate Government Schemes leveraged to needy and Eligible people.**



Key Achievements of Community Resource Center Monthly Base

Government Scheme Facilitation				
Sr. No	Gove Scheme	Gov. Support Rs/Month.	Total Beneficiaries	Total Amount/ year
1	Widow Pension	1250	641	18496350
2	Bal seva Ayog	2000	49	2254000
3	Divyang pension	1000	19	323000
4	Divang Bus pass	300	439	
5	Niradhar Pension	750	126	2808750
6	Palak Mata Pita	3000	5	516000
	Total		840	2,43,98,100

CRC MUNDRA

Widow Pension Yojna

Objective of this Yojana is to provide Financial support Rs.1250/Month to widow to made Them Financial independent. Parallely, we are conducting Motivation Session with them to raise their Value and Positivity to create healthy family Environment.

Till The date Total 641 Widow have been Linked with Government Widow pension Scheme.

Monthly Pension and other allied Scheme

Under This Program disabled Person are supported with Monthly Pension @ Rs.1000 As well allied facilities like Bus pass, Railway pass to made them Self sustain and Confident.

Till the date total 458 Divayang are linked with Different Government Scheme.

Bal Sakha Yojna

Aim Of the Yojna is to Provide Financial support Rs.2000/Month for Education Purpose to below 18 year Students who lost their Parents due to Life threatening Disease Including Covid. Total 49 Students are getting benefit of the scheme.

Palak Mata Pita Yojna:-

Motive of this scheme is to promote parents who is taking care and Nurture the child who is Below 18 year and lost their parents.@ Rs.3000/Month. Total 5 children are being supported under the scheme.

Niradhar Pension Scheme

Under this Scheme Financial Assistance 750/Month is provide to Senior citizen who don't have Surviving Children (Son) or Below 21 year son. Till The date 126 senior Citizen availing schematic benefit.



CRC MUNDRA

Some Glimpse of Cow Nutrition Support scheme Biogas Under Gobardhan scheme



Key Achievements of Community Resource Center One time

Sr. No	Gove Scheme one Time	Gov. Support	Total Beneficiaries	Total Amount/Year
1	Covid Support One Time	50000	12	6,00,000
2	Vahali Dikri @ 18 Year	110000	113	1,24,30,000
3	Divayang Sadhan Sahay one time	5000	176	8,80,000
4	Manrega (NB21)	22000	32	7,04,000
5	Pagadiya Sadhan Sahay Yojana	9000	9	81,000
6	Gau Dattak Yojana	10800	857	92,55,600
7	Gobardhan Yojana	42000	100	42,00,000
8	Fishermen Shram Yogi Yojna		163	
			1487	2,81,50,600



ADANI SKILL DEVELOPMENT CENTRE

**Total Centre
Admissions
FY 22 - 23**

Mundra

Courses	Female	Male	Total	Revenue Generated
Pedicurist and Manicurist	68	0	68	68000
Beauty Therapist	18	0	18	36000
Self Employed Tailor	31	0	31	38850
Assistant Electrician	0	50	50	188800
Bar Bender and Steel Fixer	0	29	29	0
Meson General	0	29	29	0
Domestic Data Entry Operator	47	11	58	239000
Junior Crane Operator	0	23	23	642000
Interview Skills	14	18	32	0
Mudwork	71	0	71	61600
Solar PV Manufacturing Technician	0	25	25	109500
Basic Functional English	562	670	1232	707300
Digital Literacy	391	461	852	454290
Total	1202	1316	2518	2545340

Bhuj

Courses	Female	Male	Total	Revenue Generated
Interview Skills	21	9	30	0
General Duty Assistant	45	8	53	3,09,734
Disaster Management	0	2	2	4000
Basic Functional English	1077	352	1429	8,57,400
Beauty Therapist	2	0	2	4000
Assistant Beauty Therapist	1	0	1	1500
Self Employed Tailor	8	0	8	8000
Digital Literacy	231	270	501	3,00,400
Domestic Data Entry Operator	0	1	1	4,720
Non Domain Employability Skills	21	11	32	0
Diet & Nutrition	02	00	02	9440
GST with Tally	16	01	17	98000
Understanding Operating System	21	7	28	0
Entrepreneurship	23	7	30	20,800
Financial Literacy	51	1	52	3600
Total	1519	669	2188	16,21,594

ADANI SKILL DEVELOPMENT CENTRE BHUJ

Soft Launching of Self-Employed Tailor – Outreach Batch at Meghpar

Soft Launched Self-Employed Tailor Batch at Meghpar (Out-reach). Total 25 candidates are enrolled.

Soft Launch of Entrepreneurship Development Program

Soft Launch of Entrepreneurship Development Program Training at Centre under CED with 30 candidates.

Soft Launch of General Duty Assistant Batch

Soft launched General Duty Assistant Batch with 30 candidates under DDU-GKY scheme as per instruction by GLPC.

Soft Launch of FL Training under Special Project

Launching Special Project Jointly with KMVS NGO for FSW (Female Sex Worker) Financial Literacy training Inaugurated on 22-07-2022
Total 46 women participant



ADANI SKILL DEVELOPMENT CENTRE MUNDRA

Mud Work Training– Outreach Batch at Samundra township

Total 45 candidates are enrolled.

Soft Launch of Data Entry Operator Batch

Soft launched Data Entry Operator Batch with 50 candidates under Thermax Foundation Tie-up

Soft Launch of Solar Panel Manufacturing Technician Training of Solar Panel Manufacturing Technician Training at Bhuj, ITI with 25 candidates.

Soft Launch of DL Training under DEO Project

Soft Launch of DL Training at AVMB School with 61 Students

Tie Ups with (Thermax Foundation, Empazer, Navin Group and DEO Kutch @ Rs.24.25 lacs.



ADANI SKILL DEVELOPMENT CENTRE MUNDRA

DEO Project

MOU with Kachchh District Education Office. In this MOU ASDC has provided training of Digital Literacy and Basic Functional English in Kachchh District Schools. As per MOU Kachchh District Education Office has provided 4000 candidates to us for training (Adani Skill Development Centre). Funding from Thermax, CFS and DEO made it possible

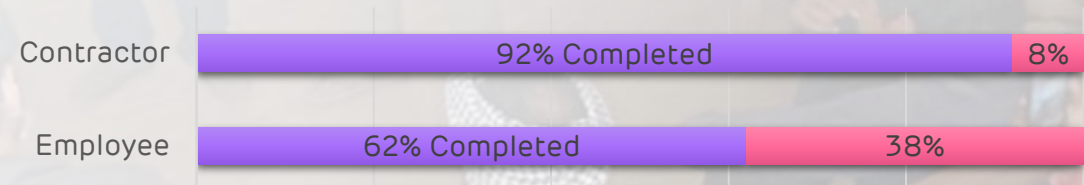
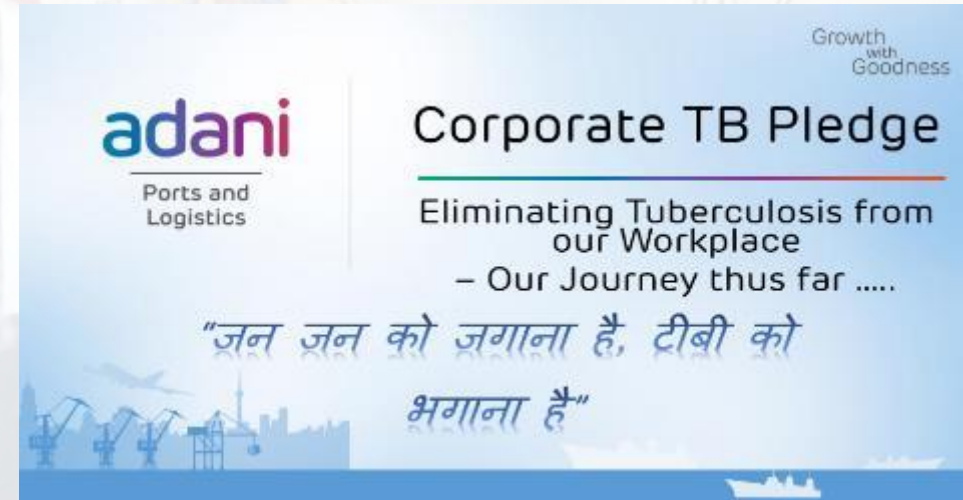
Courses	Total Students Trained
Basic Functional English	2659
Digital Literacy	1341
Total	4000



Dignity of Work Force Programme - EVP

India's National TB Elimination Programme (NTEP) aims to meet the ambitious goal, announced by the **Honorable Prime Minister Shri. Narendra Modi, of ending the TB epidemic by 2025**, five years ahead of the UN Sustainable Development Goals (SDG) of 2030. In response to this call, the Government of India and USAID jointly launched the Corporate TB pledge (CTP), in April 2019 to galvanized corporate support to end TB.

To continue the momentum and efforts, the USAID-supported iDEFEAT TB project, which is working towards institutional strengthening to accelerate actions for Tuberculosis (TB) and drug resistant TB (DR-TB) in India; was launched as USAID/India's flagship TB project. The project works in collaboration with the Central TB Division (CTD), Ministry of Health and Family Welfare (Mo HFW) of the Government of India across a network of diagnostic, treatment, and program management institutions.



No of sessions
200+



No of Trainers:
89



No of days
144



Total no covered:
8000

Dignity of Work Force Programme - EVP

The CTP secretariat, hosted at The Union under the iDEFEAT TB project, provides technical assistance to government and corporates to adapt, implement TB interventions, and guide corporate resources for TB and DR-TB care.

Early diagnostics and treatment initiation are key to saving lives and minimizing disease transmission. In 2019, India reached a milestone of 24 lakh notified cases in India, an increase of 12% compared with 2018. Even then, an estimated 5.4 lakh were 'missing' across India, a serious drawback to our TB elimination efforts as what is not measured is unlikely to be improved. Diagnostic delays are also prevalent in India, with studies indicating that these can be attributed to patients as well as health systems.

Adani foundation with APSEZ, APML, AWL and MSPVL HR department in coordination of FOKIA has launched cluster based screening program to eliminate TB in labors under Dignity of workforce program. Adani Ports and SEZ Limited has completed screening with 8000+ work force.

USAID/India team including Director – Health Office has visited Adani Foundation CSR Activities related to community health. He visited Adani Hospital, GKGH Hospital and related activities.



Dignity of Work Force Programme - EVP



Central TB Division | #TBMuk...
@TbDivision

TB-Free Workplace models were showcased in Multisectoral Corporate Engagement towards TB elimination in India conference. @Adaniports through @AdaniFoundation covered a population of over 8000 people comprising employees, family members & contractual workers at Mundra port.



Health Camp for workforce and Green Carinal Celebration



It is true that we cannot achieve our goal of development unless and until we support to bring up the lives of this community. Basic needs of this work force need to be considered. In labour Vasahats they were not getting even the facility of pure drinking water, proper living condition, sanitation which Adani Foundation has addressed one by one within last years five years span.

With the objective to build up trust and transparency in labour community, union Labours and Smooth business operations, Adani Foundation had organized 45+ labour camps for 2000+ workforce beneficiaries in coordination with Adani Wilmar Limited

18 Green carnivals

17472 Kg Fruits and Vegetable

436000 INR



Started the great initiative from world Soil Day - Biggest Employee volunteering program of Adani Ports and SEZ Limited with more than 56 employees as supporter of event organizer and 225 employees with family as a supporter of Farmers n SHGs.

Children used to enjoyed Games and Dance ! Lucky Draw surprise gift was organic ghee..

HR department, IT department and Admin department has supported a lot and will support every fortnight for this sale every sunday

ADANI KANDLA BULK TERMINAL PVT LTD - TUNA

Water at Fisherfolk settlement

Potable water (18 KL per Day)
Distribution to Vira and Dhavlvaro
Bandar through Water tanker Regularly
which improve Hygiene and Health
standard and reduce Women drudgery
,Cost and Time to get water by
**Linkages through AKBTPL and GWIL
daily bases.**

Fodder Support

Support of Dry & Green Fodder to Tuna
and Rampar Village Gaushala Cattles
during Scarcity which impacted on
Cattle health and Milk Productivity
ultimately Farmers Income as well. Total
643825 Kg green Fodder Supported for
900 Cattles of Tuna & Rampar.

Tree -Plantation

Total 200 Tree was planted and ensure
responsibility for watering and caring.
This initiative involved Community and
School students and sensitized to plant
more trees and nurture. After our
plantation, Gram Panchayat also
planted 55 Neem trees in same
premises.



ADANI KANDLA BULK TERMINAL PVT LTD - TUNA

School Renovation work Rampar

More than 800 students are studying in Rampar near Tuna port. School did great coordination to approve 3 new rooms from Sarv Shiksha Abhiyan. Other part was required renovation which was taken care by Adani Foundation. Due to this Total 6 Rooms are now in full utilization.

CC Road Wandi

Wandi is 1 km away from Adani Kandla Bulk Terminal Port Limited and 100 % Population of Fisherfolk. 1 Km Drainage line is done by WASMO – CC road request received in year 2021. Adani Foundation guided for CC road work after drainage work.

Common Gathering Flooring work, Tuna

Tuna Village is 2 Kms away from AKBTPL. In Tuna Village, community gathering shed was constructed from MLA Grant. Flooring work was not included in the same, which was taken up by Adani Foundation. Shed is well utilized in SHG meetings, Farmer meetings and Gram Sabha



ADANI GREEN ENERGY LTD - ABDASA

Adani Solar Plant Bitta is under Adani Green Energy Limited. Adani Foundation is doing regular support of JCB during monsoon or any accident cases as and when required.

Apart from it Celebrated Chairperson's Birthday by distribution of school bags to the children taking admission in class 1 along with necessary books and Education Material. Which includes Bitta School, Nani Dhufi School and Moti Dhufi School.

Deputy Collector of Abdasa taluka place, called for a meeting to all major industries of taluka area. Agenda of the meeting is to develop 7no's "Amrut Sarovar" in Abdasa taluka area under government proposal at every district level.

As per the proposed identified locations by Deputy collector, one of the location he has asked to develop by Adani Power Limited. He has proposed, "Amrut Sarovar" is developed nearby our plant area with amount Rs 20 lacs as per pond size All such proposed "Amrut Sarovar" are new only, not to develop available old pond in nearby area.



Impact Story



Ratanbhai Keshavbhai Gadhave is a farmer of Moti Khakhar. On 17th May 2022, he purchased NB Super Grass Stalk to cultivate it in 1 acre of his land. After maintaining, nurturing and hard work the grass thrived lush green with a tremendous height that's when he performed his first mowing of it.

Ratanbhai had to feed fodder to his 35 cattle regularly. While interacting, we came to know that he used to require 16kg of dry grass during summer and winter at an estimated cost of ₹1,60,000 but after planting NB Super Grass, he has saved 80-90,000rs which is approximately 50-55%. Apart from this, Ratan bhai also mentioned that during this period, he usually had a demand for 2 to 3 farm trucks of fodder which he used to order from the market but after cultivation of NB Super, not a single farm truck loaded with fodder is demanded from him.

Moreover, due to the cultivation of NB Super Grass fuel and fare expenses on farm trucks have nearly come to end. Also, Ratan bhai has already mowed the grass twice and 3rd mowing is going on having the height of grass 12-14 ft.

Lastly, Ratan bhai stated that his cattle relishes and is habituated with NB Super Grass more than any distinct fodder.

Impact Story



Amrutaben desired to ask God for one thing, a new pushcart! -

Jiluben is an elderly woman with physical limitations and a terrible economic state. She's been widowed for thirty years. Jiluben's son is 50 years old, unmarried, and almost face continuously ill. While her daughter Amrutaben is divorced (she got married 20 years ago). Jiluben, who is 70 years old only has her daughter Amrutaben is working. Amrutaben used to use her old pushcart, but it was heavy and too old for her to carry around everywhere, plus she didn't have enough money to buy a new one. Amrutaben only desired to ask God for one thing, a new pushcart! because everything else she could take care of on her own despite such bad situation.

An employee of the Adani foundation has spoken with Sarpanch Hawaben about the work being done by the Foundation on support of people with disabilities. As soon as she informed & requested that to make visit at Jiluben house. Their pushcart needs were discussed by representative from the visited, verified all the necessary paperwork, and spoke with Jiluben and her family about government programs for widows and people with disabilities. And a week later the entire process was completed, and the new pushcart was provided to them. She is now able to work promptly and help their family in overcoming this difficulty.

Impact Story



Hiruben Karsan Tharu lives with her parents in Nani Bhujpur village. She fell very ill when she was three years old. After treatment, she recovered, but her both legs were affected by the paralysis in both legs. At such a young age, she started coping up with her disability. Adani Foundation provided platform to women of Nani Bhujpur village by providing them with Sewing Machine and enrolling her in sewing machine training. Moreover, she was provided with Wheelchair and Calipers to help Hiruben move comfortably and attend class regularly.

Presently, she earns Rs. 5,000 to Rs. 6,000 a month from stitching work which is much appreciated and admired by her neighbors and relative.

Impact Story



Empowered Women, empowered nation!

India is a land of culture and traditions. These traditions are kept alive in rural locations. One such tradition is gifting daughter during her marriage for her happy married life. Sonalben too received a cow from her maternal family during her wedding. This was given with a purpose of livelihood generation at the time of crises. For sonalben, this gift was priceless, she decided to utilize income received from one cow to buy more cows. She continued to sell milk, buttermilk, Ghee, and other cow-based products and retain income to buy more cows. Gradually she increased her livestock to 66 cows which provides 165 liters of milk per month. Within 7 years of her marriage her livestock increased from 1 cow to 66 cows.

Looking at her zeal and passion towards animal husbandry, Adani Foundation provided her with Biogas kit so that she can save cooking fuel cost and fertilizer cost as waste slurry from biogas acts as a natural fertilizer.

Recently, On Kisan Divas she was felicitated by Adani Foundation for doing exceptional work in Animal Husbandry. She has now become a guide for all those women who wish to make living out of limited means.

Impact Story



"Agriculture is our wisest pursuit, because it will in the end contribute most to read wealth, good morals, and happiness." – Thomas Jefferson

It is said that one can do everything if he or she has direction and clarity towards the goal. Geetaben, a loving wife, responsible mother of 3 daughters and a son and an amazing farmer has always supported her husband in his farming occupation. Her life took a transformational turn when her husband passed away in 2018 due to severe heart attack leaving all responsibilities on her shoulder. Of course, she was working on farm keeping shoulder to shoulder with her husband before he passed away but managing farming single handedly was a tough business for her. Moreover, raising 4 daughters and a son for a widow is a somber task too. It took couple of months for her to hold herself up for the sake of her children and to make her husband's dream true. Her husband Late. Bharat Bhai Jethva hold recognition to be a first farmer in Mundra district who has initiated to cultivate Kamalam (Dragon fruit) in his farm. He had a dream to cultivate best of organic Kamalam and sell his organic fruit to a larger market. He was on cloud nine when his first harvested kamalam blossomed beautifully. But unfortunately, his heart attack pushed him to changed realm. It was her determination to continue his husband's dream and take kamalam cultivation to the next level.

As Geetaben started inclining towards chemical-free farming, she started getting higher value for her crops resulting more income. With foundation's support and guidance, she understood which crops/vegetable to sow for high returns.

Impact Story

Jethva family holds 4 acres of land and Geetaben took charge of cultivating seasonal fruits and vegetables in that farm. Being a female farmer, the use of chemical-based farming impacted her health a bit but still she used to cope up with daily chores until she had an encounter with Adani Foundation in her village Mangra. Team members Mavji Baraiya, SLD Head and Kalyan Gadhavi, Community Mobiliser from Adani Foundation organized Natural Farming training at Mangra village of Mundra district. All farmers of Mangra village participated in that training. she also attended the training in which she got insights of all techniques of natural farming and proposed support from Adani Foundation. She approached foundation team and expressed her willingness to learn more on natural farming techniques for crops, vegetables, and fruits. Before that Jethva family used to cultivate only Kamalam organically but after the intervention and continuous trainings by foundation, she decided to turn her complete farming through natural techniques by gradually taking baby steps toward this new endeavor.

Looking at her zeal and dedication for 0 chemical farming, Foundation provided her with Biogas Kit, Drip Irrigation system, Development of Vermicompost and Jivaamrut. Presently she has 6 to 7 livestock. With the installation of biogas, the slurry produced by biogas digesters makes excellent fertilizer when applied to farms. Moreover, Geetaben learnt how to make Jivaamrut from Adani Foundation's natural farming trainings, which she then applied to her farm where she noticed significant improvements, including a reduction in nutrient deficiencies, an increase in crop size without the use of chemical fertilizers and the presence of lush green, healthy crops. In addition, the Adani foundation brought knowledge of vermicompost to her farm, which she says has already made a big difference in the soil's fertility. Also, setup of drip irrigation system was done in order to save water, nutrients loss, and to provide the water direct to the soil root zone of the plant.

Prosperity knocked her door, and she provided best education to her children. Her daughters completed Engineering and Son is presently studying in Anand Agriculture University. On asking him about his future, Hariom (Son of Geetaben) shares *"My father is recognized as first farmer of Kamalam in Kutch and my mother is epitome of strength and a proud farmer. My mother has achieved lot dignity and respect in our society since she received foundation's guidance for practicing natural farming and I will follow her footsteps in same direction by establishing natural farming agriculture business to provide best quality crops to the society."* Geetaben continues to strive excellence in learning farming training regularly and become a promoter of same to encourage other farmers to adopt Natural Farming for better cultivation and higher returns.

Impact Story



At Ratadia Ganesh wala village in Mundra taluka, Rabari Megha Vanka lives with 60 percent of his legs divyang.

Meghabhai was working in a garment shop in Mundra two years ago. Bhabhi Ben used to help in running the house by making several pedas. Meghabhai lost his job during Corona time. Then Meghabhai started selling pedas in nearby villages. With the help of Adani Foundation, he was given small help for home based industry and also helped him in the process for obtaining medical certificate and bus pass. Now, Meghabhai with the help of his wife Pabi Ben started home industry 'Pena Home Udyog' and made it as the main means of livelihood. They sell 300 kilos of pedas every month. On an average they earns 18000/- per month.

When the bus pass will come he can save more money by traveling by bus for orders from Gandhidham, Bhuj, Mandvi and nearby areas.

Impact Story



Only a teacher can turn the disability into a talent ! - Mundra

Challenges are what make life interesting. Overcoming them is what makes life meaningful". Halepotra sadiya studying in class 4 of Dhrub primary school is the SEN - special education needed .she is not able to see clearly through her eyes that is having the problem of vision by birth , she underwent 4 operations but have a great IQ level which never stopped her from learning new things. sadiya's parents never stopped her coming to school. she had a problem in basic maths ,gujarati reading and writing but within an year she worked continuously during her free time and now is able to read write and perform basic calculation. Her favourite hobby is learning new things , colouring and listening new rhymes from YouTube. she can now stand up in morning assembly and give her introduction in English . "only a teacher can turn the disability into a talent through hard work and self confidence". Her dream is to become a teacher.

Impact Story



Health care service is to save the lives !

Mohammad Sadik Turk, 16, of Dhrub arrived in critical condition because of pain in the area of his kidneys. The condition was treated as an intestinal problem by doctors. The specialists tried their best to treat him & offering variety of medications. Support him for his routine dialysis for six to eight months while paying attention to his condition. He no longer needs dialysis after complete therapy, but he still needs to regularly administer injections three times every month.

Many young children pass away each year from insufficient medical care and inability to pay for necessary treatments. As long as there is only one source of income for the family and everyone depends on him, it is hard to provide costs for those who are living below the poverty line. Although India has more than 50,000 patients who receive long term dialysis, it has only a thousand kidney specialists in the entire country. Furthermore, treatment can be expensive. In situation like this Foundation pays for the child's injections in light of his financial situation and wishes him a quick recovery and a long and healthy life. The main goal of the Adani Foundation's community health care service is to save the lives of children like Sadik.

EVENTS



World water day was celebrated on 22nd March in coordination by Adani Foundation at Bhuj.

Program was designed on District level awareness on participatory ground water management on the theme of accelerating the change to solve the water and sanitation crises with exhibition of water saving tool, equipment and IEC material.

On this Occasion Mr Dilip Rana (collector Kutch) was the chief guest and guiding force. He emphasized on RRWHS with assurance to provide 50% Support from government to developed single village as model drinking water sustain village with having 100% RRWHS facilities.

Shri Dobariya Sir administrative officer of Atal Bhujal Yojana and Mr.Nimish Padke Director - Fokia also shared about sustainable management of fresh water sources for future generation. Mr.Mahendra Gadhvi (Pramukh, Jilla panchayat) also shared his views. More than 200 farmers + Women and Sarpanch of Mundra.



Project Pragati :- Success of completion of Project Pragati 1st batch was celebrated on 29th April at Adani House, Mundra in esteemed presence of Mr Vikram Tandon, Chief Human Resource Officer, Adani Group, Shri Vasant Gadhavi ,Executive Director, Adani Foundation and Mr Rakshit Shah, Executive Director, APSEZ. Other dignitaries who graced the occasion were Mr AnilKumar Kalaga, , Mr. Charles Douglas, CEO, Mundra and Tuna Ports, Jatin Trivedi, COO, Adani Skill Development Centre and all HR and Department heads of APSEZ, Power, Solar and Wilmar.

The event celebrated by distributing skill training certificate to 52 fisherfolk students, who were trained under Mason and Assistant Electrician job roles under Adani Saksham. All training along with their community leaders shared heartwarming testimonials and expressed emotion of gratitude towards Adani Foundation for providing them skill training opportunities.

EVENTS



Adani Foundation ,Mundra celebrated **World Earth Day on 22nd April 2022** by distributing 'HomeBio-Gas Kits' to 100 farmers Program intense is to gather 'धरती पुत्री' who share similar mindset and have determined to use Home Bio-Gas to witness social, economical and environmental impact.

Program was graced by Rakshit Shah, Executive Director, APSEZ along with below mentioned esteemed Guests.

1. Manojbhai Solanki, Trustee, Shree Ram krushna Trust, KUKMA
2. Prof. Mrugesh Trivedi , Scientist, Kutch University
3. Kalpesh Maheshwari, Project Officer, Atma, Bhuj
4. Dr. U.N Tank, KVK, Mundra
5. Ms. Riddhi Patel, Officer, kutch
6. Shaileshbhai Vyas, Satvik Sanstha, Kutch
7. Shantilal Patel, Officer, Mundra



Adani Foundation Mundra has celebrated the **International Disability day on 3rd Dec** since 2011 with lots of enthusiasm and Zeal in coordination with District Social Welfare office by planning various support to divyang people.

Current year in line of the international Disable day Theme "Transformative solutions for inclusive development: the role of innovation in fueling an accessible and equitable world." Adani Foundation has organized "Divyang Job Fair" in coordination with 11 SEZ Industries at Mundra on 2nd December 2022. More than 50 Divyang had applied for interview out of them 06 were selected For Job.

Apart that Divayand Aid and equipment (Limb, Chair was Supported In the Esteem Presence of Respected Rakshit sir-EDM, APSEZ, Mundra.

EVENTS



World Environment Day was celebrated on 5th June in association with Ayi Shree Vishrimata Seva Trust and Gram Panchayat, Moti Bhujpur at Vishri mata Temple and pledged to plant 51000 for which Gram Panchayat will take responsibility to nurture trees throughout this year.

program was organized at Vishrimata mandir with tree planation activity on this occasion Shree P T Prajapati - Sub Divisional Magistrate remain present and address Public to Nurture environment for Future.



Adani foundation Mundra has celebrated **International women day** on 8th march at different location of Mundra and Bhuj in coordination with District Animal health department and Sarhad Dairy the day was celebrated at Mundra with Appreciation of best 10 cattle owner women of Mundra who did remarkable work with Sarhad dairy. On this Occasion Dr Thakkar (DAHO) and Dr Lalani (cheif Sarhad dairy) appreciated efforts of Adani foundation in animal vaccination and Animal health care in Mundra. More than 210 cattle owner women remained present.

District Level celebration was done at Bhuj GKGH with Lunching OF Punya sloka book (Stories of 37 empowered women), A Book Written By Adani foundation employee Mrs. Purvi Goswami on The successful women of Kutch. More than 300 Women had participated.

EVENTS



National Farmer day on 22 dec with Honoring Women Farmers.



Animal Husbandry Awareness Program



International wet land ay Celebration Through Poster presentation Competition



Teacher Day & Youth Day Celebration



No Tobacco day celebrated by creating awareness to take preventive measures for workforce



International Yoga Day celebration in coordination with sub divisional Magistrate Mundra.

EVENTS



International coastal Day celebration
at Mandavi with Cleanliness Drive



Adani foundation and Agri
Department jointly organized
district level workshop on Natural
Farming Practice with Gram Seval



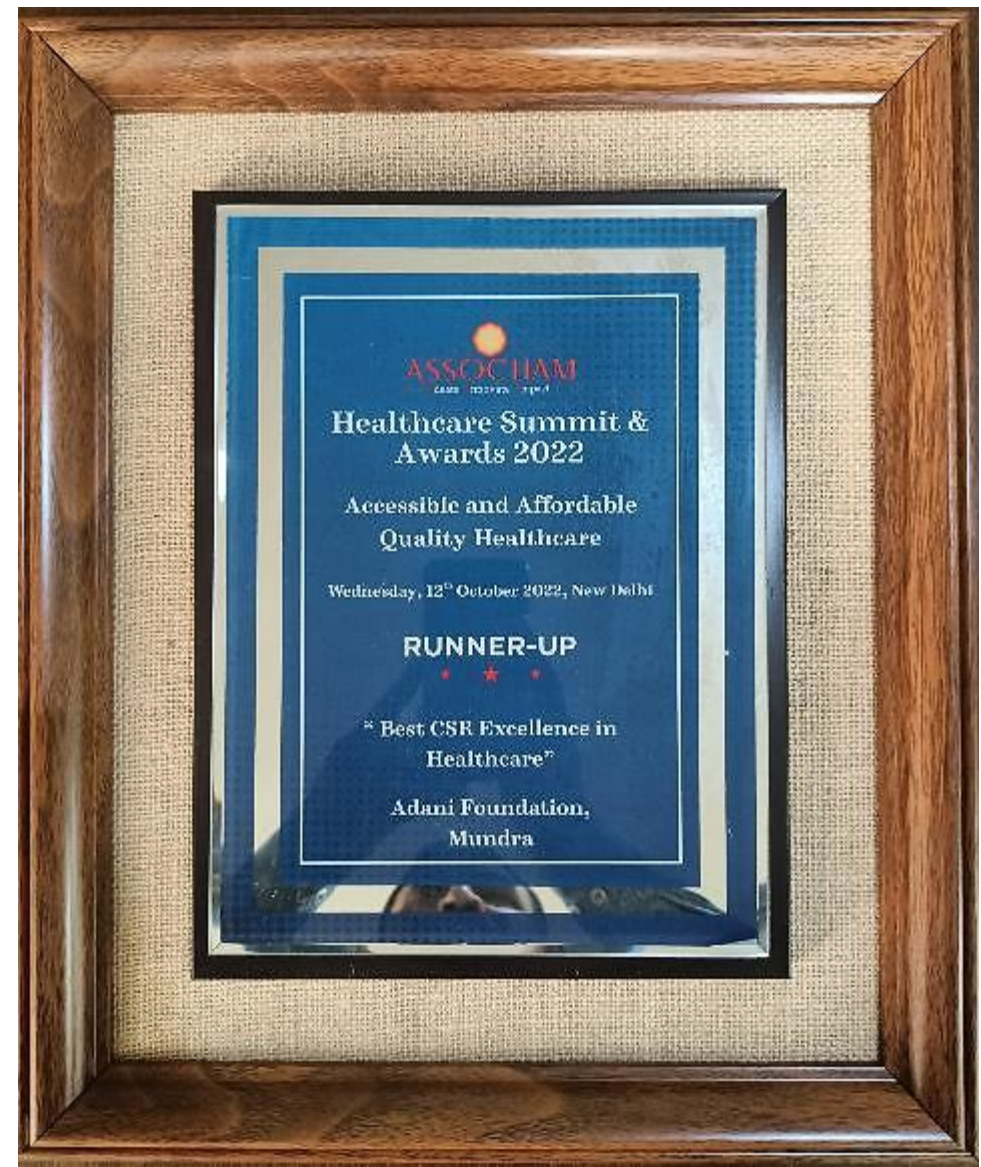
The International Mangrove Day for
the Conservation of the Mangrove
Ecosystem is celebrated

AWARDS

ASSOCHAM AWARD FOR HEALTH CARE

Adani Foundation's Community Health project received runner-up position in 'Best CSR excellence award in Healthcare' Associated Chamber of Commerce and Industry of India (ASSOCHAM) in Award ceremony organized at Delhi on 12th October 2022. Community Health project has participated in the grand event to accept the Award on behalf of Adani Foundation, Mundra site.

The award was presented by Chief Guest - Ms Roli Singh, Additional Secretary & Mission Director (NHM), Ministry of Health and Family Welfare, Govt. of India and Dr. Upasana Arora, Co-Chairperson, ASSOCHAM Healthcare Council and Chairperson, Yashoda Super Specialty Hospital.



Awards and Recognition



Adani Foundation participated in QCFI awards on 4th Feb 2023.

Presented Women Empowerment initiatives and received Diamond award for exemplary work done by Adani Foundation for empowering rural women.



our services were appreciated by representative of Ministry of Health Government India, WHO, Union and more than 52 corporate companies present in the National conference on Multisectoral corporate engagement towards TB elimination.

Awards and Recognition



Received appreciation letter from District Animal Welfare Department for commendable work for Cattles affected by Lumpy Virus



Jyoti ben tank received Awaard from Vice President in Amazing Indians Awards who is member of Prakrutik Sahkari Mandali supported by Adani Foundation.

Support to children lost their parents in Morbi bridge collapsed incidence



Adani Foundation supported 25 Lacs each for 20 children who lost their single/both the parents. Adani foundation was honored by IAS G T Pandya Collector and District magistrate of Morbi district for helping children who lost their parents in Morbi bridge accident.

One step forward towards growth with goodness...

Children residing at Morbi, Kutch, Ahmedabad, Rajkot and Dwarka who lost their single or both parents in Morbi Julfa Bridge collapse incidence received support of 25 lacs each from Adani Foundation.

Representatives from Adani Foundation, Karsanbhai and Jagrutiben visited above districts to check on the affected children and also met with SBI bank officials, collectors regarding disbursal of amount. 10 Children received amount in their respective bank accounts. For others, work is under process.



Capacity Building Training

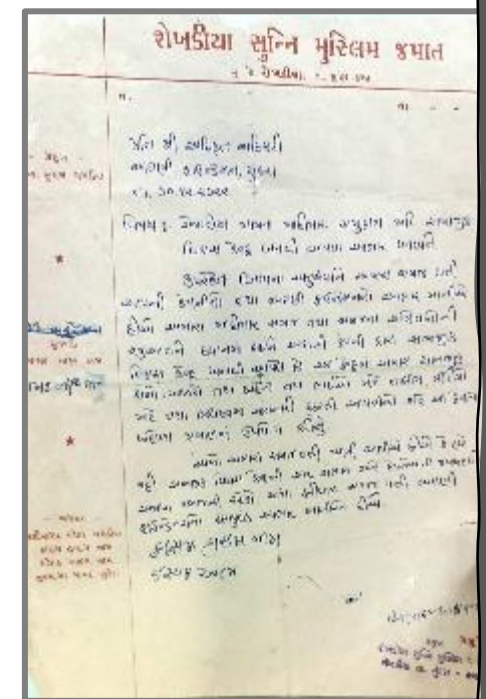
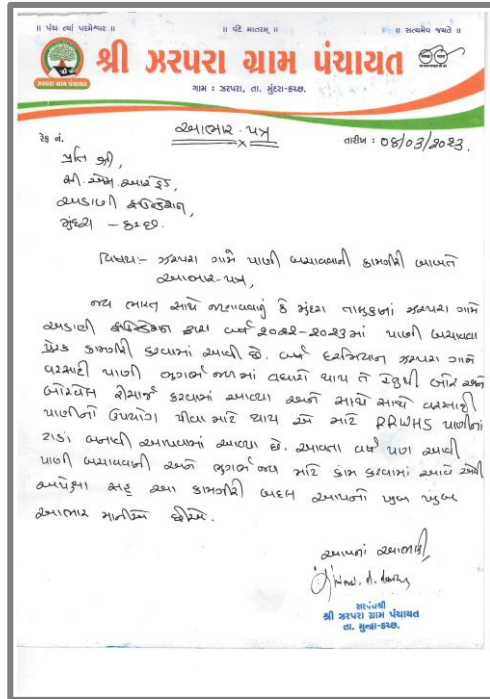


Adani foundation team visited Lakhond and Chandrani plant of sarhad Dairy. These three plant out of which two plant milk processing and packing and another plant cattle feed plant were Mr.Nilesh Jalankar, General Manager provided information about how cooperatives work in the field and about their supply chain management.



Adani Foundation team attended Capacity Building Training Program on 3rd and 4th of October on Adani Competency building and mapping. The training session was conducted by expert trainer Mr Kamal Dabbawala. Two days sessions were filled with theory sessions, Activity based learning and discussion-based learning.

Awards and Recognition



Beneficiaries List

Sr. No	Program	Direct	Indirect	Remarks
1	Education	3505	14020	UT than Mundra
2	AVMB-Vidhya mandir	568	2840	AVMB -Students
3	Community Health-Mundra	35832	141130	Rural clinic, MHCU,Health camp, AHMUPL
5	AHMUPL	42455	127365	OPD & IPD Patients
6	SLD-Women	1359	6795	SHG Group & Individual Income Generation
7	SLD-Agri & Animal Husbandry	7718	30768	Fooder,Home biogas, Farmers training, Cow based farming -20,Cattle camp Etc.
8	SLD -Fisherfolk	5957	4476	Education, Mangrove, Potable -Water and Livelihood
9	CRC-Gov Schemes	1106	5530	Government Schemes
10	CID	11767	47054	Fishermen Amenities & Other Rural Infra Work
11	Nakhtrana	1209	4836	UT than
12	AKBTPL,Tuna	10071	16373	Rural clinic, MHCU,Health camp, Drinking Water,Fooder Support, Infra Work
13	Bite	2500		Pond deepening Dhrubhi and Bitu
15	ASDC,Bhuj	2188	10940	soft skill and DL .GDA & Online Training
16	ASDC,Mundra	2518	32590	Technical & Non-Tech DL .GDA Training
17	Uddan	27377		Students
Total		156130	444417	

Financial overview – Adani Foundation Mundrta

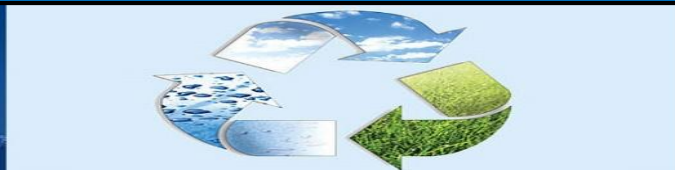
Executive Summary – Budget Utiliaztion FY 2022-23

Sr No	Particulars	Approved Budget F.Y. 2022-23			Utilization 2022-23	% of utilization
		CAPEX	OPEX	Total		
A	General Management and Administration	1.80	92.35	94.15	98.45	104.56%
B	Education	0.40	141.93	142.33	124.36	87.37%
C	Community Health	-	294.97	294.97	242.16	82.10%
D	Sustainable Livelihood Development	-	466.40	466.40	359.85	77.15%
E	Community Infrastructure Development	-	219.51	219.51	133.88	60.99%
F	EDM Recommended Projects	-	100.00	100.00	98.83	98.83%
	Total AF CSR Budget :	2.20	1,315.16	1,317.36	1,057.53	80.28%
[I]	Adani Vidya Mandir-Bhadreshwar	6.88	255.44	262.32	221.76	84.54%
[II]	Project Udaan-Mundra	-	314.74	314.74	248.20	78.86%
	TOTAL Budget with AVMB & UDAAN F.Y. 2022-23 :	9.08	1,885.34	1,894.42	1,527.49	80.63%



THANK YOU

Annexure – 3



“Half Yearly Environmental Monitoring Reports “

For,



M/S. ADANI PORTS & SPECIAL ECONOMIC ZONE LTD.

PLOT NO. 169/P, AT - NAVINAL ISLAND, TAL. - MUNDRA, DIST. - KUTCH - 370421.

Monitoring Period: October – 2022 to March - 2023

Submitted By



UniStar Environment & Research Labs Pvt. Ltd.

White House, Near GIDC Office, Char Rasta, Vapi, Gujarat, India – 396195



MARINE WATER MONITORING SUMMARY REPORT

RESULTS OF MARINE WATER [M1 LEFT SIDE OF BOCHA CREEK - N 22°45'183" E 069°43'241"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.12	8.02	8.14	8.06	8.17	8.02	8.14	7.98	8.16	8.02	8.28	7.94	IS 3025 (Part11)1983
2.	Temperature	°C	30.3	30.2	30	29.9	29.8	29.7	29.7	29.6	29.8	29.7	30	29.9	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	146	126	138	122	126	114	146	118	104	94	144	112	APHA 23 rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	2.9	BDL	2.8	BDL	2.9	BDL	2.8	BDL	2.9	BDL	3.1	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.22	6.02	6.1	5.9	6.2	6	6.2	5.99	6.09	5.88	6.13	5.83	APHA 23 rd Ed.,2017,4500-O, B
6.	Salinity	ppt	35.36	35.88	35.32	36.12	36.02	36.44	35.86	36.12	35.46	36.11	36.12	36.84	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39) 1991, Amd. 2
8.	Nitrate as NO ₃	μmol/L	2.33	2.24	2.93	2.76	3.45	3.02	2.93	2.76	2.67	2.76	3.45	2.8	APHA 23 rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO ₂	μmol/L	0.379	0.362	0.3	0.235	0.302	0.276	0.3	0.235	0.198	0.379	0.345	0.276	APHA 23 rd Ed.,2017,4500NO ₂ B
10.	Ammonical Nitrogen as NH ₃	μmol/L	3.4	3.36	2.54	2.45	3.19	2.84	2.54	2.45	2.24	2.32	3.28	3.1	APHA 23 rd Ed., 2017,4500- NH ₃ B
11.	Phosphates as PO ₄	μmol/L	BDL	BDL	BDL	BDL	BDL	BDL	0.47	BDL	0.65	0.47	0.78	0.6	APHA 23 rd Ed.,2017,4500-P, D
12.	Total Nitrogen	μmol/L	6.109	5.962	5.77	5.445	6.942	6.136	5.77	5.445	5.108	5.459	7.075	6.176	APHA 23 rd Ed., 2017,4500 NH ₃ - B
13.	Petroleum Hydrocarbon	μg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23 rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	35912	36114	35864	36108	36086	36474	35864	36410	35108	35686	36640	37400	APHA 23 rd Ed.,2017, 2540- C
15.	COD	mg/L	36.07	28.06	16.62	12.47	32.13	24.1	32.16	24.12	24.19	24.12	28.2	12.08	APHA 23 rd Ed.,2017, 5220-B

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RESULTS OF MARINE WATER [M1 LEFT SIDE OF BOCHA CREEK - N 22°45'183" E 069°43'241"]

SR. NO.	TEST PARAMETERS	UNIT	Oct-22		Nov-22		Dec-22		Jan-23		Feb-23		Mar-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A	Phytoplankton														
1.	Chlorophyll	mg/m³	2.4	2.36	2.51	3.25	3.21	2.56	3.15	2.51	2.8	3.14	2.45	3.24	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m³	1.02	1.23	0.98	2.1	1.3	1.65	1.11	1.6	1.23	2.11	0.96	1.36	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10³/L	90	78	140	87	152	120	162	118	128	129	142	142	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	<i>Odentella</i>	<i>Diploneis</i>	<i>Nitzschia</i>	<i>Navicula</i>	<i>Pinnularia</i>	<i>Grammatophora</i>	<i>Pinnularia</i>	<i>Grammatophora</i>	<i>Diploneis</i>	<i>Rhizosolenia</i>	<i>Navicula</i>	<i>Nitzschia</i>	APHA (23rd Ed. 2017)10200 F
			<i>Cyclotella</i>	<i>Rhizosolenia</i>	<i>Pinnularia</i>	<i>Cyclotella</i>	<i>Surirella</i>	<i>Rhizosolenia</i>	<i>Surirella</i>	<i>Rhizosolenia</i>	<i>Rhizosolenia</i>	<i>Pinnularia</i>	<i>Cyclotella</i>	<i>Pinnularia</i>	
			<i>Pinnularia</i>	<i>Nitzschia</i>	<i>Odontella</i>	<i>Pinnularia</i>	<i>Odentella</i>	<i>Nitzschia</i>	<i>Odontella</i>	<i>Nitzschia</i>	<i>Nitzschia</i>	<i>Thalassiothrix</i>	<i>Pinnularia</i>	<i>Odontella</i>	
			<i>Biddulphia</i>	<i>Thalassiothrix</i>	<i>Dinophysis</i>	<i>Skeletonema</i>	<i>Grammatophora</i>	<i>Thalassiosira</i>	<i>Grammatophora</i>	<i>Thalassiosira</i>	<i>Cyclotella</i>	<i>Grammatophora</i>	<i>Skeletonema</i>	<i>Dinophysis</i>	
			<i>Thalassiosira</i>	<i>Pleurosigma</i>	<i>Surirella</i>	<i>Thalassiosira</i>	<i>Melosira</i>	<i>Pleurosigma</i>	<i>Melosira</i>	<i>Pleurosigma</i>	<i>Pleurosigma</i>	<i>Ceratium</i>	<i>Thalassiosira</i>	<i>Surirella</i>	

B									
Zooplankton									
1	Abundance(Population)	noX103/ 100 m3	52	69	87	92	69	53	APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		<i>Copepods nauplii</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Copepods nauplii</i>	
			<i>Crustacean Larvae</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Crustacean Larvae</i>	
			<i>Oikoplura</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Oikoplura</i>	
			<i>Bivalve Larvae</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Bivalve Larvae</i>	
			<i>Oikoplura</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Oikoplura</i>	
3	Total Biomass	ml/100 m³	15.36	14.35	15.74	15.74	16.32	16.33	

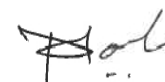
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RESULTS OF MARINE WATER [M1 LEFT SIDE OF BOCHA CREEK - N 22°45'183" E 069°43'241"]

SR. NO.	TEST PARAMETERS	UNIT	Oct-22		Nov-22		Dec-22		Jan-23		Feb-23		Mar-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
C	Microbiological														
1	Total Bacterial Count	CFU/ml	210		140		152		150		168		148		APHA 23 rd Ed.2017,9215-C
2	Total Coliform	/100ml	32		58		44		42		40		41		APHA 23 rd Ed.2017,9222-B
3	Ecoli	/100ml	14		32		23		22		20		35		IS :15185:2016
4	Enterococcus	/100ml	12		20		12		14		11		20		IS:15186:2002
5	Salmonella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS:15187:2016
6	Shigella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		APHA 23 rd Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976



Mr. Nilesh Patel
Sr. Chemist

Mr. Nitin Tandel
Technical Manager

RESULTS OF SEDIMENT ANALYSIS [M1 LEFT SIDE OF BOCHA CREEK - N 22°45'183" E 069°43'241"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022 SEDIMENT	NOVEMBER-2022 SEDIMENT	DECEMBER-2022 SEDIMENT	JANUARY-2023 SEDIMENT	FEBRUARY-2023 SEDIMENT	MARCH-2023 SEDIMENT	TEST METHOD
1.	Organic Matter	%	0.59	0.62	0.52	0.48	0.52	0.56	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	534.2	542.4	590.2	520.4	562.2	548.6	IS: 10158 :1982, RA.2009 Method B
3.	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	Sandy	Lab SOP No. UERL/CHM/LTM/108
4.	Petroleum Hydrocarbon	µg/g	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
5.0	Heavy Metals								
5.1	Aluminum as Al	%	3.52	3.64	3.82	3.88	3.97	3.86	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	102.4	111.2	118.4	126.7	142.2	124.2	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	592.5	582.4	610.2	580.4	590.2	602.2	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	4.21	4.26	4.31	4.21	3.88	3.94	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	54.23	55.34	49.82	44.46	52.24	52.22	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	42.59	44.64	38.25	42.42	40.15	44.36	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	88.54	84.26	94.21	90.2	82.9	104.2	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	2.84	2.82	2.54	2.62	2.86	2.36	EPA 3050B /7420 (Extraction &Analytical Method):1986
5.9	Mercury as Hg	µg/g	BDL	BDL	BDL	BDL	BDL	BDL	EPA 7471B (Extraction &Analytical Method) :2007

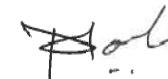
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RESULTS OF SEDIMENT ANALYSIS [M1 LEFT SIDE OF BOCHA CREEK - N 22°45'183" E 069°43'241"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022 SEDIMENT	NOVEMBER-2022 SEDIMENT	DECEMBER-2022 SEDIMENT	JANUARY-2023 SEDIMENT	FEBRUARY-2023 SEDIMENT	MARCH-2023 SEDIMENT	TEST METHOD
D	Benthic Organisms								
1	Macrobenthos	--	<i>Isopods</i>	<i>Isopods</i>	<i>Amphipods</i>	<i>Amphipods</i>	<i>Amphipods</i>	<i>Isopods</i>	APHA (23rd Ed. 2017)10500 C
			<i>Polychates</i>	<i>Polychates</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Polychates</i>	
			<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Sipunculids</i>	
			<i>Amphipods</i>	<i>Amphipods</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Amphipods</i>	
2	MeioBenthos	--	<i>Polychates</i>	<i>Polychates</i>	Decapods Larvae	Decapods Larvae	<i>Polychates</i>	<i>Polychates</i>	
			<i>Foraminiferan</i>	<i>Foraminiferan</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Foraminiferan</i>	
3	Population	no/m ²	312	300	245	242	263	236	



Mr. Nilesh Patel
Sr. Chemist

Mr. Nitin Tandel
Technical Manager

RESULTS OF MARINE WATER [M2 MOUTH OF BOCHA & NAVINAL CREEK - N 22°44'239" E 069°43'757"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.18	8.11	8.16	8.04	8.21	8.09	8.18	8.11	8.22	8.14	8.06	7.72	IS 3025 (Part11)1983
2.	Temperature	°C	30.2	30	30.1	30	29.7	29.6	29.7	29.6	29.8	29.7	30	29.8	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	132	108	128	112	134	114	154	124	148	118	160	134	APHA 23 rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	3	BDL	3.1	BDL	3	BDL	3.1	BDL	3	BDL	2.8	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.12	5.92	6	5.8	5.9	5.8	6.1	5.89	6.19	5.99	5.93	5.73	APHA 23 rd Ed.,2017,4500-O, B
6.	Salinity	ppt	35.34	35.92	36.14	36.58	35.98	36.51	35.46	36.24	35.52	36.14	36.18	36.9	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39) 1991, Amd. 2
8.	Nitrate as NO ₃	μmol/L	2.54	2.5	3.45	2.76	3.23	2.59	3.45	2.76	2.93	2.67	2.16	2.59	APHA 23 rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO ₂	μmol/L	0.431	0.414	0.431	0.345	0.413	0.379	0.431	0.345	0.241	0.198	0.189	0.241	APHA 23 rd Ed.,2017,4500NO ₂ B
10.	Ammonical Nitrogen as NH ₃	μmol/L	3.53	3.4	2.84	2.49	3.66	2.93	2.84	2.49	2.41	2.24	3.84	3.36	APHA 23 rd Ed., 2017,4500- NH3 B
11.	Phosphates as PO ₄	μmol/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.6	BDL	BDL	BDL	APHA 23 rd Ed.,2017,4500-P, D
12.	Total Nitrogen	μmol/L	6.501	6.314	6.721	5.595	7.303	5.899	6.721	5.595	5.581	5.108	6.189	6.191	APHA 23 rd Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	μg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23 rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	35844	36452	35746	36312	35988	36370	35280	35860	35188	35722	35940	36500	APHA 23 rd Ed.,2017, 2540- C
15.	COD	mg/L	32.06	24.05	24.94	20.78	28.11	20.08	36.18	28.14	24.19	12.1	32.22	16.11	APHA 23 rd Ed.,2017, 5220-B

RESULTS OF MARINE WATER [M2 MOUTH OF BOCHA & NAVINAL CREEK - N 22°44'239" E 069°43'757"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A	Phytoplankton														
1.	Chlorophyll	mg/m³	2.95	2.05	3.12	3.62	2.63	2.87	3.01	3.01	3.21	2.45	2.96	2.78	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m³	0.9	0.87	0.87	0.65	0.96	1.47	0.86	1.5	1.65	1.29	1.36	2.01	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10³/L	100	102	105	98	125	114	132	116	147	98	123	112	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	Diploneis	Pinnularia	Odontella	Surirella	Nitzschia	Coscinodiscus	Nitzschia	Coscinodiscus	Ceratium	Diploneis	Surirella	Odontella	APHA (23rd Ed. 2017)10200 F
			Rhizosolenia	Surirella	Rhizosolenia	Rhizosolenia	Pinnularia	Diploneis	Pinnularia	Diploneis	Coscinodiscus	Rhizosolenia	Rhizosolenia	Rhizosolenia	
			Nitzschia	Navicula	Coscinodiscus	Nitzschia	Odontella	Rhizosolenia	Odontella	Rhizosolenia	Odontella	Nitzschia	Nitzschia	Coscinodiscus	
			Cyclotella	Thalassiosira	Grammatophora	Thalassionema	Dinophysis	Dinophysis	Dinophysis	Dinophysis	Grammatophora	Thalassiothrix	Thalassionema	Grammatophora	
			Pleurosigma	Skeletonema	Thalassiosira	Pleurosigma	Surirella	Thalassionema	Surirella	Thalassionema	Melosira	Pleurosigma	Pleurosigma	Thalassiosira	

B										Zooplankton										
1	Abundance(Population)	noX103 / 100 m3	47	58	69	72	88	90	APHA (23rd Ed. 2017)10200 G											
2	Name of Group Number and name of group species of each group		Copepods	Decapoda	Decapoda	Decapoda	Decapoda	Decapoda	Copepods											
			Oikoplura	Copepods	Copepods	Copepods	Copepods	Copepods	Oikoplura											
			Crustacean Larvae	Crustacean Larvae	Crustacean Larvae	Crustacean Larvae	Crustacean Larvae	Crustacean Larvae	Crustacean Larvae											
			Crustacean	Crustacean	Crustacean	Crustacean	Crustacean	Crustacean	Crustacean											
			Bivalve Larvae	Oikoplura	Oikoplura	Oikoplura	Oikoplura	Oikoplura	Bivalve Larvae											
3	Total Biomass	ml/100 m³	14.89	15.98	17.69	17.69	18.52	17.44												

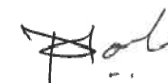
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RESULTS OF MARINE WATER [M2 MOUTH OF BOCHA & NAVINAL CREEK - N 22°44'239" E 069°43'757"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
C	Microbiological														
1	Total Bacterial Count	CFU/ml	200		200		220		218		236		230		APHA 23 rd Ed.2017,9215-C
2	Total Coliform	/100ml	44		44		68		65		37		44		APHA 23 rd Ed.2017,9222-B
3	E.coli	/100ml	22		22		41		42		29		31		IS :15185:2016
4	Enterococcus	/100ml	14		14		21		22		21		20		IS:15186:2002
5	Salmonella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS:15187:2016
6	Shigella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		APHA 23 rd Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976



Mr. Nilesh Patel
Sr. Chemist

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Technical Manager

RESULTS OF SEDIMENT ANALYSIS [M2 MOUTH OF BOCHA & NAVINAL CREEK - N 22°44'239" E 069°43'757"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022	NOVEMBER-2022	DECEMBER-2022	JANUARY-2023	FEBRUARY-2023	MARCH-2023	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1.	Organic Matter	%	0.53	0.58	0.51	0.46	0.51	0.62	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	512.5	516.8	528.9	544.1	560.4	546.5	IS: 10158 :1982, RA.2009 Method B
3.	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	Sandy	Lab SOP No. UERL/CHM/LTM/108
4.	Petroleum Hydrocarbon	µg/g	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
5.0	Heavy Metals								
5.1	Aluminum as Al	%	3.64	3.72	3.81	3.89	3.94	4.02	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	102.6	111.8	124.2	134.2	138.6	144.2	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	582.4	574.6	602.1	624.5	629.3	594.4	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	3.74	3.82	3.91	3.94	3.96	4.08	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	48.9	52.2	48.62	44.52	46.44	42.35	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	44.58	46.58	41.28	42.22	42.9	44.05	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	84.25	84.11	90.8	88.46	86.5	88.29	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	2.26	2.34	2.29	2.24	2.31	2.38	EPA 3050B /7420 (Extraction &Analytical Method):1986
5.9	Mercury as Hg	µg/g	BDL	BDL	BDL	BDL	BDL	BDL	EPA 7471B (Extraction &Analytical Method) :2007

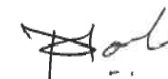
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RESULTS OF SEDIMENT ANALYSIS [M2 MOUTH OF BOCHA & NAVINAL CREEK - N 22°44'239" E 069°43'757"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022	NOVEMBER-2022	DECEMBER-2022	JANUARY-2023	FEBRUARY-2023	MARCH-2023	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
D			Benthic Organisms						
1	Macrobenthos	--	<i>Amphipods</i>	<i>Foraminiferan</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Foraminiferan</i>	APHA (23rd Ed. 2017)10500 C
			<i>Decapod Larvae</i>	<i>Decapods Larvae</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Decapods Larvae</i>	
			<i>Isopods</i>	<i>Amphipods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Amphipods</i>	
			<i>Gastropods</i>	<i>Polychates</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Polychates</i>	
2	MeioBenthos	--	<i>Foraminiferan</i>	<i>Turbellarians</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Foraminiferan</i>	<i>Turbellarians</i>	
			<i>Herpectacoids</i>	<i>Foraminiferan</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Foraminiferan</i>	
3	Population	no/m ²	290	325	312	318	300	286	



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RESULTS OF MARINE WATER [M3 EAST OF BOCHAISLANOT DETECTED - N 22°46'530" E 069°41'690"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.22	8.06	8.19	8.11	8.14	7.98	8.19	8.06	8.16	8.02	7.96	7.68	IS 3025 (Part11)1983
2.	Temperature	°C	30.2	30.1	30	29.9	29.8	29.7	29.7	29.6	29.8	29.7	30	29.9	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	94	78	86	80	98	82	118	94	104	94	128	114	APHA 23 rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	2.6	BDL	2.9	BDL	2.8	BDL	2.9	BDL	2.9	BDL	2.8	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.02	5.81	6	5.9	5.9	5.7	5.99	5.79	6.09	5.88	5.83	5.63	APHA 23 rd Ed.,2017,4500-O, B
6.	Salinity	ppt	35.39	36.05	35.4	36.14	35.64	36.22	35.72	35.98	35.46	36.11	36.23	37.02	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39) 1991, Amd. 2
8.	Nitrate as NO ₃	μmol/L	2.41	2.37	2.76	2.59	2.49	2.15	2.84	2.59	2.67	2.76	2.93	2.76	APHA 23 rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO ₂	μmol/L	0.465	0.448	0.379	0.276	0.259	0.13	0.474	0.31	0.198	0.379	0.3	0.235	APHA 23 rd Ed.,2017,4500NO ₂ B
10.	Ammonical Nitrogen as NH ₃	μmol/L	3.45	3.4	2.32	1.56	2.28	1.81	2.41	1.89	2.24	2.32	3.1	2.93	APHA 23 rd Ed., 2017,4500- NH3 B
11.	Phosphates as PO ₄	μmol/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.65	0.47	BDL	BDL	APHA 23 rd Ed.,2017,4500-P, D
12.	Total Nitrogen	μmol/L	6.325	6.218	5.459	4.426	5.029	4.09	5.724	4.79	5.108	5.459	6.33	5.925	APHA 23 rd Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	μg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23 rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	36110	36714	35890	36670	36112	36642	35240	35940	35108	35686	35860	36480	APHA 23 rd Ed.,2017, 2540- C
15.	COD	mg/L	28.06	20.04	24.94	16.62	32.13	24.1	32.16	24.12	24.19	24.12	28.2	16.11	APHA 23 rd Ed.,2017, 5220-B

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RESULTS OF MARINE WATER [M3 EAST OF BOCHAISLANOT DETECTED - N 22°46'530" E 069°41'690"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A			Phytoplankton												
1.	Chlorophyll	mg/m³	2.49	3.11	3.1	3.25	2.87	3.21	3.11	3.2	2.95	2.58	3.11	3.65	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytn	mg/m³	1.2	2.1	1.41	1.87	1.45	1.84	1.34	1.9	1.56	1.36	2.31	2.03	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10³/L	102	120	112	109	135	152	140	160	138	143	178	148	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	Ceratium	Coscinodiscus	Pinnularia	Coscinodiscus	Odontella	Rhizosolenia	Odontella	Rhizosolenia	Odontella	Surirella	Coscinodiscus	Pinnularia	APHA (23rd Ed. 2017)10200 F
			Diploneis	Thalassionema	Biddulphia	Thalassionema	Rhizosolenia	Pinnularia	Rhizosolenia	Pinnularia	Rhizosolenia	Rhizosolenia	Thalassionema	Biddulphia	
			Odontella	Rhizosolenia	Navicula	Rhizosolenia	Coscinodiscus	Thalassiothrix	Coscinodiscus	Thalassiothrix	Coscinodiscus	Nitzschia	Rhizosolenia	Navicula	
			Grammatophora	Dinophysis	Thallassiosira	Dinophysis	Grammatophora	Grammatophora	Grammatophora	Grammatophora	Grammatophora	Thalassionema	Dinophysis	Thallassiosira	
			Melosira	Skeletonema	Skeletonema	Skeletonema	Thallassiosira	Ceratium	Thallassiosira	Ceratium	Thallassiosira	Pleurosigma	Skeletonema	Skeletonema	

B			Zooplankton												
1	Abundance (Population)	noX10 ³ / 100 m ³	46	50	48	51	59	60	APHA (23rd Ed. 2017)10200 G						
2	Name of Group Number and name of group species of each group		<i>Egg(Fish and Shrimps)</i>	<i>Egg(Fish and Shrimps)</i>	<i>Egg(Fish and Shrimps)</i>	<i>Egg(Fish and Shrimps)</i>	<i>Egg(Fish and Shrimps)</i>	<i>Oikoplura</i>							
			<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Copepods nauplii</i>							
			<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Crustacean Larvae</i>							
			<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>							
			<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>							
3	Total Biomass	ml/100 m ³	17.54	16.74	15.89	15.89	14.23	15.63							

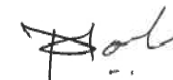
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RESULTS OF MARINE WATER [M3 EAST OF BOCHAISLANOT DETECTED - N 22°46'530" E 069°41'690"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
C			Microbiological												
1	Total Bacterial Count	CFU/ml	186		186		124		126		180		186		APHA 23 rd Ed.2017,9215-C
2	Total Coliform	/100ml	50		49		36		40		60		43		APHA 23 rd Ed.2017,9222-B
3	E.coli	/100ml	32		30		25		30		38		26		IS :15185:2016
4	Enterococcus	/100ml	20		25		15		18		23		17		IS:15186:2002
5	Salmonella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS:15187:2016
6	Shigella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		APHA 23 rd Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976



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RESULTS OF SEDIMENT ANALYSIS [M3 EAST OF BOCHASLANOT DETECTED - N 22°46'530" E 069°41'690"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022 SEDIMENT	NOVEMBER-2022 SEDIMENT	DECEMBER-2022 SEDIMENT	JANUARY-2023 SEDIMENT	FEBRUARY-2023 SEDIMENT	MARCH-2023 SEDIMENT	TEST METHOD
1.	Organic Matter	%	0.64	0.62	0.54	0.58	0.52	0.58	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	562.4	542.2	569.8	542.2	562.2	574.4	IS: 10158 :1982, RA.2009 Method B
3.	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	Sandy	Lab SOP No. UERL/CHM/LTM/108
4.	Petroleum Hydrocarbon	µg/g	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
5.0	Heavy Metals								
5.1	Aluminum as Al	%	3.72	3.78	3.82	3.91	3.97	3.78	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	124.6	132.2	124.6	134.2	142.2	154.6	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	542.2	564.2	576.2	586.2	590.2	602.8	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	3.66	3.74	3.79	3.84	3.88	4.11	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	48.25	51.32	48.64	49.24	52.24	55.35	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	38.69	40.25	38.42	39.25	40.15	38.24	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	74.28	72.24	79.81	80.4	82.9	80.38	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	3.12	2.98	2.84	2.81	2.86	2.75	EPA 3050B /7420 (Extraction &Analytical Method):1986
5.9	Mercury as Hg	µg/g	BDL	BDL	BDL	BDL	BDL	BDL	EPA 7471B (Extraction &Analytical Method) :2007

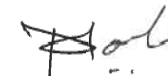
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RESULTS OF SEDIMENT ANALYSIS [M3 EAST OF BOCHASLANOT DETECTED - N 22°46'530" E 069°41'690"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022 SEDIMENT	NOVEMBER-2022 SEDIMENT	DECEMBER-2022 SEDIMENT	JANUARY-2023 SEDIMENT	FEBRUARY-2023 SEDIMENT	MARCH-2023 SEDIMENT	TEST METHOD
D			Benthic Organisms						
1	Macrobenthos	--	Decapods Larvae	<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Isopods</i>	<i>Amphipods</i>	APHA (23rd Ed. 2017)10500 C
			<i>Isopods</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Sipunculids</i>	<i>Decapod Larvae</i>	
			<i>Amphipods</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Isopods</i>	
			<i>Sipunculids</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Gastropods</i>	
2	MeioBenthos	--	<i>Foraminiferan</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Foraminiferan</i>	
			<i>Herpectacoids</i>	<i>Foraminiferan</i>	<i>Foraminiferan</i>	<i>Foraminiferan</i>	<i>Foraminiferan</i>	<i>Herpectacoids</i>	
3	Population	no/m ²	326	365	326	322	268	263	



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RESULTS OF MARINE WATER [M4 JUNA BANOT DETECTEDAR N 22°47'577" E 069°43'620"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.21	8.06	8.18	8.09	8.17	8.05	8.14	8.02	8.19	8.05	8.24	8.01	IS 3025 (Part11)1983
2.	Temperature	°C	30.2	30	29.9	29.8	29.7	29.6	29.6	29.5	29.8	29.7	30	29.8	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	134	114	118	102	126	112	160	114	142	108	118	110	APHA 23 rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	2.5	BDL	2.8	BDL	3.1	BDL	3.3	BDL	3.1	BDL	3.2	BDL	IS 3025(Part 4)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.32	6.22	6.1	6	6	5.8	6.3	6.2	6.3	5.88	6.13	6.03	APHA 23 rd Ed.,2017,4500-O, B
6.	Salinity	ppt	35.48	36.11	35.94	36.28	36.11	36.37	35.74	36.12	35.81	36.17	36.24	36.68	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39) 1991, Amd.2
8.	Nitrate as NO ₃	μmol/L	2.72	2.67	3.66	3.44	2.72	2.67	2.16	2.59	2.59	2.32	3.23	2.8	APHA 23 rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO ₂	μmol/L	0.5	0.483	0.413	0.379	0.5	0.483	0.189	0.241	0.56	0.431	0.379	0.344	APHA 23 rd Ed.,2017,4500NO ₂ B
10.	Ammonical Nitrogen as NH ₃	μmol/L	3.36	3.32	3.96	3.62	3.36	3.32	2.62	3.84	2.49	2.24	3.96	3.36	APHA 23 rd Ed., 2017,4500- NH3 B
11.	Phosphates as PO ₄	μmol/L	BDL	BDL	BDL	BDL	BDL	BDL	0.82	BDL	1.38	1.25	0.47	BDL	APHA 23 rd Ed.,2017,4500-P, D
12.	Total Nitrogen	μmol/L	6.58	6.473	8.033	7.439	6.58	6.473	4.969	6.671	5.64	4.991	7.569	6.504	APHA 23 rd Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	μg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23 rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	36118	35624	35812	36214	35864	36354	35120	35862	35244	36124	36350	37110	APHA 23 rd Ed.,2017, 2540- C
15.	COD	mg/L	24.05	32.06	20.78	12.47	20.08	8.03	28.14	20.1	20.16	16.13	32.22	20.14	APHA 23 rd Ed.,2017, 5220-B

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RESULTS OF MARINE WATER [M4 JUNA BANOT DETECTEDAR N 22°47'577" E 069°43'620"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A	Phytoplankton														
1.	Chlorophyll	mg/m³	2.69	2.78	3.65	2.78	3.2	3.11	2.98	2.87	3.01	2.96	2.58	2.48	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m³	1.32	0.69	1.25	0.89	0.99	1.56	0.87	1.45	1.23	1.84	1.47	1.86	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10³/L	111	110	125	128	127	149	124	152	146	169	123	176	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	<i>Pinnularia</i>	<i>Pleurosigma</i>	<i>Coscinodiscus</i>	<i>Ceratium</i>	<i>Coscinodiscus</i>	<i>Diploneis</i>	<i>Coscinodiscus</i>	<i>Diploneis</i>	<i>Coscinodiscus</i>	<i>Coscinodiscus</i>	<i>Ceratium</i>	<i>Coscinodiscus</i>	APHA (23rd Ed. 2017)10200 F
			<i>Thalassionema</i>	<i>Cyclotella</i>	<i>Diploneis</i>	<i>Diploneis</i>	<i>Diploneis</i>	<i>Rhizosolenia</i>	<i>Diploneis</i>	<i>Rhizosolenia</i>	<i>Diploneis</i>	<i>Thalassionema</i>	<i>Diploneis</i>	<i>Thalassionema</i>	
			<i>Navicula</i>	<i>Biddulphia</i>	<i>Rhizosolenia</i>	<i>Odontella</i>	<i>Rhizosolenia</i>	<i>Nitzschia</i>	<i>Rhizosolenia</i>	<i>Nitzschia</i>	<i>Rhizosolenia</i>	<i>Rhizosolenia</i>	<i>Odontella</i>	<i>Rhizosolenia</i>	
			<i>Thalassiosira</i>	<i>Skeletonema</i>	<i>Dinophysis</i>	<i>Grammatophora</i>	<i>Dinophysis</i>	<i>Thalassiothrix</i>	<i>Dinophysis</i>	<i>Thalassiothrix</i>	<i>Dinophysis</i>	<i>Dinophysis</i>	<i>Grammatophora</i>	<i>Dinophysis</i>	
			<i>Skeletonema</i>	<i>Thalassiosira</i>	<i>Thalassionema</i>	<i>Melosira</i>	<i>Thalassionema</i>	<i>Pleurosigma</i>	<i>Thalassionema</i>	<i>Pleurosigma</i>	<i>Thalassionema</i>	<i>Skeletonema</i>	<i>Melosira</i>	<i>Skeletonema</i>	

B			Zooplankton												
1	Abundance(Population)	noX103 / 100 m ³	39	60	74	75	66	74							APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Decapoda</i>							
			<i>Egg(Fish and Shrimps)</i>	<i>Egg(Fish and Shrimps)</i>	<i>Egg(Fish and Shrimps)</i>	<i>Egg(Fish and Shrimps)</i>	<i>Egg(Fish and Shrimps)</i>	<i>Copepods</i>							
			<i>Copepods</i>	<i>Copepods</i>	<i>Copepods</i>	<i>Copepods</i>	<i>Copepods</i>	<i>Crustacean Larvae</i>							
			<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>							
			<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Oikoplura</i>							
3	Total Biomass	ml/100 m ³	15.63	15.96	15.64	15.64	16.52	15.89							

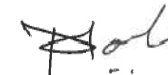
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RESULTS OF MARINE WATER [M4 JUNA BANOT DETECTEDAR N 22°47'577" E 069°43'620"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM			
C			Microbiological												
1	Total Bacterial Count	CFU/ml	194		194		222		220		250		262		APHA 23 rd Ed.2017,9215-C
2	Total Coliform	/100ml	30		30		40		38		42		52		APHA 23 rd Ed.2017,9222-B
3	E.coli	/100ml	22		22		31		33		22		36		IS :15185:2016
4	Enterococcus	/100ml	19		19		22		30		10		26		IS:15186:2002
5	Salmonella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS:15187:2016
6	Shigella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		APHA 23 rd Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976



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Sr. Chemist

Mr. Nitin Tandel
Technical Manager

RESULTS OF SEDIMENT ANALYSIS [M4 JUNA BANOT DETECTEDAR N 22°47'577" E 069°43'620"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022	NOVEMBER-2022	DECEMBER-2022	JANUARY-2023	FEBRUARY-2023	MARCH-2023	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1.	Organic Matter	%	0.86	0.74	0.62	0.59	0.54	0.57	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	580.4	538.4	546.7	534	552.4	562.4	IS: 10158 :1982, RA.2009 Method B
3.	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	Sandy	Lab SOP No. UERL/CHM/LTM/108
4.	Petroleum Hydrocarbon	µg/g	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
5.0	Heavy Metals								
5.1	Aluminum as Al	%	3.52	3.62	3.69	3.62	3.74	3.92	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	110.4	114.5	118.6	104	112	124.2	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	539.4	540.9	551.2	548.5	550.4	562.8	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	4.11	4.06	4.11	4.06	4.09	3.89	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	38.64	41.11	46.21	44.02	44.52	42.15	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	42.61	44.25	46.33	48.26	51.24	48.65	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	84.21	81.36	89.45	88.05	82.54	80.28	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	2.56	2.46	2.42	2.51	2.42	2.28	EPA 3050B /7420 (Extraction &Analytical Method):1986
5.9	Mercury as Hg	µg/g	BDL	BDL	BDL	BDL	BDL	BDL	EPA 7471B (Extraction &Analytical Method) :2007

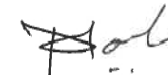
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RESULTS OF SEDIMENT ANALYSIS [M4 JUNA BANOT DETECTEDAR N 22°47'577" E 069°43'620"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022 SEDIMENT	NOVEMBER-2022 SEDIMENT	DECEMBER-2022 SEDIMENT	JANUARY-2023 SEDIMENT	FEBRUARY-2023 SEDIMENT	MARCH-2023 SEDIMENT	TEST METHOD
D			Benthic Organisms						
1	Macrobenthos	--	<i>Polychates</i>	<i>Polychates</i>	<i>Foraminiferan</i>	<i>Foraminiferan</i>	<i>Foraminiferan</i>	Decapods Larvae	APHA (23rd Ed. 2017)10500 C
			<i>Gastropods</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Isopods</i>	
			<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Amphipods</i>	
			<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	
2	MeioBenthos	--	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	Decapods Larvae	<i>Foraminiferan</i>	
			<i>Polychates</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Herpectacoids</i>	
3	Population	no/m ²	300	328	286	301	295	325	



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Mr. Nitin Tandel
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RESULTS OF MARINE WATER [M5 TOWARDS WESTERN SIDE OF EAST PORT – N 22°46'041" E 069°47'296"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.19	8.09	8.21	8.11	8.19	8.1	8.15	8.02	8.21	7.98	8.24	7.88	IS 3025 (Part11)1983
2.	Temperature	°C	30.3	30.2	30	29.9	29.8	29.7	29.7	29.6	29.8	29.7	30	29.8	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	144	126	134	122	128	112	146	116	132	118	102	92	APHA 23 rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	2.8	BDL	2.7	BDL	2.9	BDL	3.4	BDL	2.8	BDL	2.6	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.32	6.12	6.2	6.1	6.1	6	6.3	6.1	6.3	6.19	6.13	5.93	APHA 23 rd Ed.,2017,4500-O, B
6.	Salinity	ppt	35.49	35.98	35.64	36.24	35.82	36.34	35.44	35.89	35.64	36.08	36.11	36.72	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39)1991, Amd.2
8.	Nitrate as NO ₃	μmol/L	2.8	2.67	2.93	2.37	2.8	2.59	2.59	3.66	2.76	2.59	2.84	2.76	APHA 23 rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO ₂	μmol/L	0.414	0.379	0.241	0.198	0.362	0.345	0.259	0.328	0.379	0.276	0.474	0.431	APHA 23 rd Ed.,2017,4500NO ₂ B
10.	Ammonical Nitrogen as NH ₃	μmol/L	3.28	3.23	3.32	3.1	2.8	2.5	3.84	3.79	2.32	1.56	2.93	2.76	APHA 23 rd Ed., 2017,4500- NH3 B
11.	Phosphates as PO ₄	μmol/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.6	BDL	0.78	0.69	APHA 23 rd Ed.,2017,4500-P, D
12.	Total Nitrogen	μmol/L	6.494	6.279	6.491	5.668	5.962	5.435	6.689	7.778	5.459	4.426	6.244	5.951	APHA 23 rd Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	μg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23 rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	35980	36588	35868	36452	36002	36444	35266	36020	35348	36244	35800	36520	APHA 23 rd Ed.,2017, 2540- C
15.	COD	mg/L	20.04	8.02	20.78	8.31	16.06	12.05	24.12	12.06	20.16	16.13	24.17	20.14	APHA 23 rd Ed.,2017, 5220-B

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RESULTS OF MARINE WATER [M5 TOWARDS WESTERN SIDE OF EAST PORT – N 22°46'041" E 069°47'296"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A			Phytoplankton												
1.	Chlorophyll	mg/m³	3.14	2.87	2.69	2.87	3.11	2.87	2.87	2.65	2.58	3.23	3.11	2.68	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytn	mg/m³	0.85	0.85	1.11	0.36	2.22	1.33	1.89	1.32	1.59	2.56	1.36	2.56	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10³/L	101	96	130	86	175	123	167	119	143	178	132	146	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	Pinnularia	Grammatophora	Pinnularia	Ceratium	Navicula	Nitzschia	Navicula	Nitzschia	Ceratium	Nitzschia	Ceratium	Pleurosigma	APHA (23rd Ed. 2017)10200 F
			Biddulphia	Rhizosolenia	Biddulphia	Pinnularia	Fragillaria	Grammatophora	Fragillaria	Grammatophora	Diploneis	Grammatophora	Diploneis	Cyclotella	
			Navicula	Nitzschia	Navicula	Odontella	Thalassiothrix	Diploneis	Thalassiothrix	Diploneis	Odontella	Diploneis	Odontella	Biddulphia	
			Thalassiosira	Thalassiosira	Thalassiosira	Thalassiothrix	Grammatophora	Thalassiothrix	Grammatophora	Thalassiothrix	Grammatophora	Thalassiothrix	Grammatophora	Skeletonema	
			Skeletonema	Pleurosigma	Skeletonema	Thalassiosira	Surirella	Pleurosigma	Surirella	Pleurosigma	Melosira	Pleurosigma	Melosira	Thalassiosira	

B			Zooplankton												
1	Abundance (Population)	noX10 ³ / 100 m ³	63	48	50	54	48	55							APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		<i>Copepods nauplii</i>	<i>Egg (Fish and Shrimps)</i>	<i>Egg (Fish and Shrimps)</i>	<i>Egg (Fish and Shrimps)</i>	<i>Egg (Fish and Shrimps)</i>	<i>Egg (Fish and Shrimps)</i>							
			<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Decapoda</i>							
			<i>Crustacean Larvae</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>							
			<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>							
3	Total Biomass	ml/100 m ³	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>							APHA (23rd Ed. 2017)10200 G
			17.54	16.35	14.88	14.88	15.68	16.23							

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RESULTS OF MARINE WATER [M5 TOWARDS WESTERN SIDE OF EAST PORT – N 22°46'041" E 069°47'296"]

MoEF&CC (GOI) Recognized Environmental
Laboratory under the EPA-1986 (12.01.2020 to 17.03.2023)

QCI-NABET Accredited EIA
Consultant Organization

GPCB Recognized Environmental
Auditor (Schedule-II)

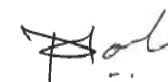
ISO 9001:2015
Certified Company

ISO 45001:2018
Certified Company

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
C			Microbiological												
1	Total Bacterial Count	CFU/ml	190		216		256		254		178		196		APHA 23 rd Ed.2017,9215-C
2	Total Coliform	/100ml	36		30		65		70		56		63		APHA 23 rd Ed.2017,9222-B
3	E.coli	/100ml	27		17		41		45		49		42		IS:15185:2016
4	Enterococcus	/100ml	15		10		19		21		29		22		IS:15186:2002
5	Salmonella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS:15187:2016
6	Shigella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		APHA 23 rd Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976



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RESULTS OF SEDIMENT ANALYSIS [M5 TOWARDS WESTERN SIDE OF EAST PORT – N 22°46'041" E 069°47'296"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022 SEDIMENT	NOVEMBER-2022 SEDIMENT	DECEMBER-2022 SEDIMENT	JANUARY-2023 SEDIMENT	FEBRUARY-2023 SEDIMENT	MARCH-2023 SEDIMENT	TEST METHOD
1.	Organic Matter	%	0.56	0.52	0.48	0.41	0.46	0.54	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	562.8	544.2	536.6	505.4	510.2	521.4	IS: 10158 :1982, RA.2009 Method B
3.	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	Sandy	Lab SOP No. UERL/CHM/LTM/108
4.	Petroleum Hydrocarbon	µg/g	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
5.0	Heavy Metals								
5.1	Aluminum as Al	%	3.68	3.71	3.78	3.81	3.89	3.96	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	68.4	69.5	74.8	78.4	80.2	84.4	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	448.6	456.6	470.4	501.2	520.2	522.7	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	3.54	3.63	3.75	3.81	3.88	4.06	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	44.67	45.58	42.64	44.25	45.28	41.39	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	34.59	35.12	38.42	40.14	42.16	46.36	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	84.56	85.24	89.42	80.28	82.24	80.33	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	2.54	2.62	2.56	2.64	2.53	2.46	EPA 3050B /7420 (Extraction &Analytical Method):1986
5.9	Mercury as Hg	µg/g	BDL	BDL	BDL	BDL	BDL	BDL	EPA 7471B (Extraction &Analytical Method) :2007

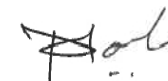
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RESULTS OF SEDIMENT ANALYSIS [M5 TOWARDS WESTERN SIDE OF EAST PORT – N 22°46'041" E 069°47'296"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022 SEDIMENT	NOVEMBER-2022 SEDIMENT	DECEMBER-2022 SEDIMENT	JANUARY-2023 SEDIMENT	FEBRUARY-2023 SEDIMENT	MARCH-2023 SEDIMENT	TEST METHOD
D			Benthic Organisms						
1	Macrobenthos	--	<i>Amphipods</i>	<i>Amphipods</i>	<i>Amphipods</i>	<i>Amphipods</i>	<i>Amphipods</i>	<i>Polychates</i>	APHA (23rd Ed. 2017)10500 C
			<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Sipunculids</i>	<i>Gastropods</i>	
			<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	
			<i>Gastropods</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Sipunculids</i>	
2	MeioBenthos	--	Decapods Larvae	Decapods Larvae	Decapods Larvae	Decapods Larvae	Decapods Larvae	<i>Herpectacoids</i>	
			<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Polychates</i>	
3	Population	no/m ²	328	360	360	362	301	365	



Mr. Nilesh Patel
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Mr. Nitin Tandel
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RESULTS OF MARINE WATER [M7 EAST PORT N 22°47'120" E 069°47'110"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.24	8.08	8.16	8.11	8.19	8.06	8.14	7.94	8.18	8.06	8.14	7.74	IS 3025 (Part11)1983
2.	Temperature	°C	30.2	30.1	29.9	29.8	29.7	29.6	29.6	29.5	29.7	29.6	30	29.8	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	148	128	134	106	130	112	124	108	144	118	162	148	APHA 23 rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	2.9	BDL	2.8	BDL	2.9	BDL	3.2	BDL	3.1	BDL	2.4	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.22	6.02	6	5.9	5.9	5.7	6.2	5.99	6.19	6.09	6.03	5.83	APHA 23 rd Ed.,2017,4500-O, B
6.	Salinity	ppt	35.32	36.04	35.84	36.19	35.76	36.21	35.34	35.56	35.38	35.97	35.94	36.51	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39)1991, Amd. 2
8.	Nitrate as NO ₃	μmol/L	2.72	2.67	3.45	3.02	2.76	2.59	3.23	2.37	3.44	2.59	2.76	2.32	APHA 23 rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO ₂	μmol/L	0.379	0.362	0.302	0.276	0.379	0.276	0.345	0.302	0.344	0.293	0.379	0.431	APHA 23 rd Ed.,2017,4500NO ₂ B
10.	Ammonical Nitrogen as NH ₃	μmol/L	3.45	3.36	3.19	2.84	2.32	1.56	3.62	3.28	3.83	2.75	3.19	3.02	APHA 23 rd Ed., 2017,4500- NH3 B
11.	Phosphates as PO ₄	μmol/L	BDL	BDL	BDL	BDL	BDL	BDL	0.52	BDL	0.86	0.78	1.29	1.12	APHA 23 rd Ed.,2017,4500-P, D
12.	Total Nitrogen	μmol/L	6.549	6.392	6.942	6.136	5.459	4.426	7.195	5.952	7.614	5.633	6.329	5.771	APHA 23 rd Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	μg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23 rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	36110	35614	35718	36214	35894	36338	36288	36582	36324	36842	37210	37840	APHA 23 rd Ed.,2017, 2540- C
15.	COD	mg/L	16.03	12.02	37.4	29.09	24.1	20.08	20.1	16.08	32.26	20.16	36.25	24.17	APHA 23 rd Ed.,2017, 5220-B

Continue...

RESULTS OF MARINE WATER [M7 EAST PORT N 22°47'120" E 069°47'110"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A			Phytoplankton												
1.	Chlorophyll	mg/m³	2.87	2.89	2.87	3.69	3.25	3.25	3.24	2.8	3.11	3.68	2.78	2.58	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m³	0.78	1.95	0.74	2.48	1.56	1.75	1.45	1.8	2.13	2.21	1.58	2.36	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10³/L	90	125	121	142	147	168	140	155	176	93	125	100	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	Coscinodiscus	Coscinodiscus	Coscinodiscus	Surirella	Ceratium	Grammatophora	Ceratium	Grammatophora	Thalassiothrix	Odontella	Grammatophora	Grammatophora	APHA (23rd Ed. 2017)10200 F
			Diploneis	Diploneis	Diploneis	Thalassiothrix	Diploneis	Melosira	Diploneis	Melosira	Surirella	Rhizosolenia	Rhizosolenia	Rhizosolenia	
			Rhizosolenia	Rhizosolenia	Rhizosolenia	Navicula	Odontella	Odontella	Odontella	Odontella	Navicula	Coscinodiscus	Nitzschia	Nitzschia	
			Dinophysis	Dinophysis	Dinophysis	Skeletonema	Grammatophora	Pinnularia	Grammatophora	Pinnularia	Thalassiosira	Grammatophora	Thalassiosira	Thalassiosira	
			Thalassionema	Thalassionema	Thalassionema	Thalassiosira	Melosira	Pleurosigma	Melosira	Pleurosigma	Skeletonema	Thalassiosira	Pleurosigma	Pleurosigma	

B			Zooplankton												
1	Abundance (Population)	noX10 ³ / 100 m ³	50	38	44	52	57	59							APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		<i>Egg(Fish and Shrimps)</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Copepods nauplii</i>	<i>Crustacean Larvae</i>							
			<i>Oikoplura</i>	<i>Egg(Fish and Shrimps)</i>	<i>Egg(Fish and Shrimps)</i>	<i>Egg(Fish and Shrimps)</i>	<i>Crustacean Larvae</i>	<i>Egg(Fish and Shrimps)</i>							
			<i>Copepods nauplii</i>	<i>Copepods</i>	<i>Copepods</i>	<i>Copepods</i>	<i>Oikoplura</i>	<i>Copepods</i>							
			<i>Crustacean Bivalve Larvae</i>	<i>Crustacean Bivalve Larvae</i>	<i>Crustacean Bivalve Larvae</i>	<i>Crustacean Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Crustacean Bivalve Larvae</i>							
3	Total Biomass	ml/100 m ³	15.78	15.28	16.89	16.89	15.55	17.23							

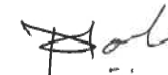
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RESULTS OF MARINE WATER [M7 EAST PORT N 22°47'120" E 069°47'110"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM			
C			Microbiological												
1	Total Bacterial Count	CFU/ml	250		184		242		240		290		244		APHA 23 rd Ed.2017,9215-C
2	Total Coliform	/100ml	36		33		36		40		55		36		APHA 23 rd Ed.2017,9222-B
3	E.coli	/100ml	29		29		29		31		41		25		IS :15185:2016
4	Enterococcus	/100ml	18		19		21		22		32		16		IS:15186:2002
5	Salmonella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS:15187:2016
6	Shigella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		APHA 23 rd Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976



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Sr. Chemist

Mr. Nitin Tandel
Technical Manager

RESULTS OF MARINE WATER [M8 RIGHT SIDE OF BOCHA CREEK N 22°45'987" E 069°43'119"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.18	7.98	8.22	8.12	8.18	8.07	8.21	8.12	8.19	8.11	8.28	8.04	IS 3025 (Part11)1983
2.	Temperature	°C	30.2	30.1	30	29.9	29.6	29.5	29.5	29.4	29.8	29.7	30	29.8	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	118	104	124	112	130	116	152	114	146	124	128	120	APHA 23 rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	3.1	BDL	3	BDL	2.8	BDL	3.1	BDL	2.9	BDL	2.8	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.12	5.92	5.8	5.7	5.9	5.7	6.1	5.89	6.09	5.99	5.93	5.73	APHA 23 rd Ed.,2017,4500-O, B
6.	Salinity	ppt	35.64	36.12	35.61	36.24	36.82	36.19	36.12	36.32	35.86	36.17	36.18	36.74	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39) 1991, Amd. 2
8.	Nitrate as NO ₃	μmol/L	2.54	2.5	2.49	2.32	2.8	2.37	2.33	2.24	3.45	2.8	2.84	2.59	APHA 23 rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO ₂	μmol/L	0.431	0.414	0.259	0.215	0.259	0.189	0.379	0.362	0.345	0.276	0.56	0.517	APHA 23 rd Ed.,2017,4500NO ₂ B
10.	Ammonical Nitrogen as NH ₃	μmol/L	3.1	3.02	2.28	2.16	4.05	3.83	3.4	3.36	3.28	3.1	3.36	3.1	APHA 23 rd Ed., 2017,4500- NH3 B
11.	Phosphates as PO ₄	μmol/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.65	BDL	BDL	BDL	APHA 23 rd Ed.,2017,4500-P, D
12.	Total Nitrogen	μmol/L	6.071	5.934	5.029	4.695	7.109	6.389	6.109	5.962	7.075	6.176	6.76	6.207	APHA 23 rd Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	μg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23 rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	36218	36684	36188	36522	36124	36514	35620	36080	35760	36240	36300	37050	APHA 23 rd Ed.,2017, 2540- C
15.	COD	mg/L	24.05	20.04	33.25	24.94	24.1	16.06	28.14	24.12	28.22	24.19	32.22	28.2	APHA 23 rd Ed.,2017, 5220-B

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RESULTS OF MARINE WATER [M8 RIGHT SIDE OF BOCHA CREEK N 22°45'987" E 069°43'119"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A			Phytoplankton												
1.	Chlorophyll	mg/m ³	2.36	2.36	3.25	2.14	2.96	2.77	3.11	2.78	2.65	2.87	2.45	3.14	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m ³	1.86	0.75	0.95	0.89	1.11	1.28	0.98	1.32	1.12	1.66	1.69	2.13	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10 ³ /L	120	142	135	128	163	86	170	95	162	120	122	175	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	<i>Grammatophora</i>	<i>Rhizosolenia</i>	<i>Thalassiothrix</i>	<i>Rhizosolenia</i>	<i>Coscinodiscus</i>	<i>Skeletonema</i>	<i>Coscinodiscus</i>	<i>Skeletonema</i>	<i>Coscinodiscus</i>	<i>Dinophysis</i>	<i>Coscinodiscus</i>	<i>Coscinodiscus</i>	APHA (23rd Ed. 2017)10200 F
			<i>Rhizosolenia</i>	<i>Pinnularia</i>	<i>Surirella</i>	<i>Pinnularia</i>	<i>Diploneis</i>	<i>Grammatophora</i>	<i>Diploneis</i>	<i>Grammatophora</i>	<i>Diploneis</i>	<i>Pinnularia</i>	<i>Diploneis</i>	<i>Diploneis</i>	
			<i>Nitzschia</i>	<i>Thalassiothrix</i>	<i>Navicula</i>	<i>Thalassiothrix</i>	<i>Rhizosolenia</i>	<i>Nitzschia</i>	<i>Rhizosolenia</i>	<i>Nitzschia</i>	<i>Rhizosolenia</i>	<i>Thalassiothrix</i>	<i>Rhizosolenia</i>	<i>Rhizosolenia</i>	
			<i>Thalassionema</i>	<i>Grammatophora</i>	<i>Thalassiosira</i>	<i>Grammatophora</i>	<i>Dinophysis</i>	<i>Thalassiothrix</i>	<i>Dinophysis</i>	<i>Thalassiothrix</i>	<i>Dinophysis</i>	<i>Grammatophora</i>	<i>Dinophysis</i>	<i>Dinophysis</i>	
			<i>Pleurosigma</i>	<i>Ceratium</i>	<i>Skeletonema</i>	<i>Ceratium</i>	<i>Thalassionema</i>	<i>Pleurosigma</i>	<i>Thalassionema</i>	<i>Pleurosigma</i>	<i>Thalassionema</i>	<i>Ceratium</i>	<i>Thalassionema</i>	<i>Thalassionema</i>	

B			Zooplankton												
1	Abundance (Population)	noX10 ³ / 100 m ³	45	56	61	70	52	50	APHA (23rd Ed. 2017)10200 G						
2	Name of Group Number and name of group species of each group		<i>Crustacean</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Copepods</i>	<i>Copepods</i>							
			<i>Oikoplura</i>	<i>Copepods</i>	<i>Copepods</i>	<i>Copepods</i>	<i>Oikoplura</i>	<i>Oikoplura</i>							
			<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>							
			<i>Oikoplura</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Crustacean</i>	<i>Crustacean</i>							
			<i>Bivalve Larvae</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>							
3	Total Biomass	ml/100 m ³	17.21	16.98	15.48	15.6	16.24	17.42							

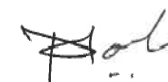
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RESULTS OF MARINE WATER [M8 RIGHT SIDE OF BOCHA CREEK N 22°45'987" E 069°43'119"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM			
C			Microbiological												
1	Total Bacterial Count	CFU/ml	270		128		284		284		164		256		APHA 23 rd Ed.2017,9215-C
2	Total Coliform	/100ml	40		24		41		42		35		41		APHA 23 rd Ed.2017,9222-B
3	E.coli	/100ml	33		12		33		32		28		31		IS :15185:2016
4	Enterococcus	/100ml	20		8		16		18		11		23		IS:15186:2002
5	Salmonella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS:15187:2016
6	Shigella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		APHA 23 rd Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976



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RESULTS OF SEDIMENT ANALYSIS [M8 RIGHT SIDE OF BOCHA CREEK N 22°45'987" E 069°43'119"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022	NOVEMBER-2022	DECEMBER-2022	JANUARY-2023	FEBRUARY-2023	MARCH-2023	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1.	Organic Matter	%	0.62	0.59	0.51	0.43	0.48	0.56	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	541.2	525.2	532.4	506.4	514.2	523.6	IS: 10158 :1982, RA.2009 Method B
3.	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	Sandy	Lab SOP No. UERL/CHM/LTM/108
4.	Petroleum Hydrocarbon	µg/g	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
5.0	Heavy Metals								
5.1	Aluminum as Al	%	3.49	3.55	3.64	3.71	3.46	3.62	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	74.2	78.5	86.5	88.2	86.3	89.6	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	524.64	534.4	551.2	542.4	548.3	555.8	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	3.58	3.62	3.71	3.76	3.81	3.96	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	36.21	36.28	38.26	38.88	39.42	42.21	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	28.64	29.22	34.21	35.06	36.28	37.21	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	82.48	84.12	91.24	92.12	91.8	98.1	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	3.11	2.86	2.81	2.74	2.46	2.52	EPA 3050B /7420 (Extraction &Analytical Method):1986
5.9	Mercury as Hg	µg/g	BDL	BDL	BDL	BDL	BDL	BDL	EPA 7471B (Extraction &Analytical Method) :2007

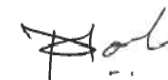
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RESULTS OF SEDIMENT ANALYSIS [M8 RIGHT SIDE OF BOCHA CREEK N 22°45'987" E 069°43'119"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022 SEDIMENT	NOVEMBER-2022 SEDIMENT	DECEMBER-2022 SEDIMENT	JANUARY-2023 SEDIMENT	FEBRUARY-2023 SEDIMENT	MARCH-2023 SEDIMENT	TEST METHOD
D			Benthic Organisms						
1	Macrobenthos	--	Gastropods	Gastropods	Isopods	Isopods	Isopods	Sipunculids	APHA (23rd Ed. 2017)10500 C
			Polychates	Polychates	Polychates	Polychates	Polychates	Polychates	
			Sipunculids	Sipunculids	Sipunculids	Sipunculids	Sipunculids	Gastropods	
			Amphipods	Amphipods	Amphipods	Amphipods	Amphipods	Isopods	
2	MeioBenthos	--	Herpectacoids	Herpectacoids	Herpectacoids	Herpectacoids	Herpectacoids	Herpectacoids	
			Foraminiferan	Foraminiferan	Decapods Larvae	Decapods Larvae	Decapods Larvae	Foraminiferan	
3	Population	no/m ²	270	240	312	320	347	289	



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RESULTS OF MARINE WATER [M11 MPT T1 JETTY N 22°42'278" E 069°43'450"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.24	8.11	8.06	7.94	8.12	7.97	8.18	8.04	8.17	8.07	8.12	7.84	IS 3025 (Part11)1983
2.	Temperature	°C	30.3	30.2	29.9	29.8	29.7	29.6	29.6	29.5	29.8	29.7	29.9	28.8	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	134	116	128	106	134	118	124	108	111	102	118	94	APHA 23 rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	2.9	BDL	3.1	BDL	2.8	BDL	3.3	BDL	2.8	BDL	3	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.12	6.02	6	5.9	5.9	5.8	6.1	5.99	5.99	5.88	5.93	5.83	APHA 23 rd Ed.,2017,4500-O, B
6.	Salinity	ppt	35.41	36.15	35.44	36.24	35.52	36.22	35.02	35.84	35.24	35.89	35.82	36.27	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39) 1991, Amd. 2
8.	Nitrate as NO ₃	μmol/L	2.5	2.41	2.84	2.59	3.66	3.02	2.76	2.59	2.72	2.67	2.93	2.67	APHA 23 rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO ₂	μmol/L	0.448	0.431	0.345	0.3	0.328	0.259	0.379	0.276	0.5	0.483	0.241	0.198	APHA 23 rd Ed.,2017,4500NO ₂ B
10.	Ammonical Nitrogen as NH ₃	μmol/L	3.36	3.28	2.49	2.06	3.79	3.36	2.32	1.56	3.36	3.32	2.84	2.67	APHA 23 rd Ed., 2017,4500- NH ₃ B
11.	Phosphates as PO ₄	μmol/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.47	BDL	BDL	BDL	APHA 23 rd Ed.,2017,4500-P, D
12.	Total Nitrogen	μmol/L	6.308	6.121	5.675	4.95	7.778	6.639	5.459	4.426	6.58	6.473	6.011	5.538	APHA 23 rd Ed., 2017,4500 NH ₃ - B
13.	Petroleum Hydrocarbon	μg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23 rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	35984	36594	35864	36486	35800	36470	35422	35940	35420	36260	36890	37400	APHA 23 rd Ed.,2017, 2540- C
15.	COD	mg/L	24.05	16.03	29.09	20.78	20.08	12.05	28.14	20.1	24.19	20.16	28.2	24.17	APHA 23 rd Ed.,2017, 5220-B

Continue...

RESULTS OF MARINE WATER [M11 MPT T1 JETTY N 22°42'278" E 069°43'450"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A			Phytoplankton												
1.	Chlorophyll	mg/m ³	3.21	2.6	3.21	3.21	3.26	3.14	3.33	3.17	3.02	3.64	3.25	2.88	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m ³	1.02	1.1	2.23	1.47	1.85	2	1.78	1.99	2.01	2.13	1.96	1.86	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10 ³ /L	86	135	90	96	152	135	149	132	140	155	152	146	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	<i>Nitzschia</i>	<i>Melosira</i>	<i>Navicula</i>	<i>Pinnularia</i>	<i>Fragillaria</i>	<i>Ceratium</i>	<i>Fragillaria</i>	<i>Ceratium</i>	<i>Thalassiosira</i>	<i>Rhizosolenia</i>	<i>Rhizosolenia</i>	<i>Diploneis</i>	APHA (23rd Ed. 2017)10200 F
			<i>Pinnularia</i>	<i>Cyclotella</i>	<i>Skeletonema</i>	<i>Surirella</i>	<i>Thalassionema</i>	<i>Pinnularia</i>	<i>Thalassionema</i>	<i>Pinnularia</i>	<i>Melosira</i>	<i>Pinnularia</i>	<i>Pinnularia</i>	<i>Rhizosolenia</i>	
			<i>Odontella</i>	<i>Odontella</i>	<i>Rhizosolenia</i>	<i>Odontella</i>	<i>Navicula</i>	<i>Odontella</i>	<i>Navicula</i>	<i>Odontella</i>	<i>Nitzschia</i>	<i>Thalassiotrix</i>	<i>Thalassiotrix</i>	<i>Nitzschia</i>	
			<i>Dinophysis</i>	<i>Skeletonema</i>	<i>Dinophysis</i>	<i>Grammatophora</i>	<i>Thalassiosira</i>	<i>Thalassiotrix</i>	<i>Thalassiosira</i>	<i>Thalassiotrix</i>	<i>Rhizosolenia</i>	<i>Grammatophora</i>	<i>Grammatophora</i>	<i>Thalassiotrix</i>	
			<i>Surirella</i>	<i>Thalassiosira</i>	<i>Thalassionema</i>	<i>Melosira</i>	<i>Skeletonema</i>	<i>Thalassiosira</i>	<i>Skeletonema</i>	<i>Thalassiosira</i>	<i>Pleurosigma</i>	<i>Ceratium</i>	<i>Ceratium</i>	<i>Pleurosigma</i>	

B			Zooplankton						APHA (23rd Ed. 2017)10200 G
1	Abundance(Population)	noX103 / 100 m3	52	49	54	59	64	44	
2	Name of Group Number and name of group species of each group		<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Decapoda</i>	
			<i>Copepods</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Copepods</i>	
			<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	
			<i>Bivalve Larvae</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Crustacean</i>	
			<i>Crustacean</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Oikoplura</i>	
3	Total Biomass	ml/100 m³	14.58	15.63	14.63	15.03	16.47	14.23	

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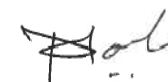
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RESULTS OF MARINE WATER [M11 MPT T1 JETTY N 22°42'278" E 069°43'450"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM			
C			Microbiological												
1	Total Bacterial Count	CFU/ml	248		200		200		211		186		202		APHA 23 rd Ed.2017,9215-C
2	Total Coliform	/100ml	35		39		39		41		50		47		APHA 23 rd Ed.2017,9222-B
3	E.coli	/100ml	30		29		29		32		26		30		IS :15185:2016
4	Enterococcus	/100ml	28		22		22		24		14		21		IS:15186:2002
5	Salmonella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS:15187:2016
6	Shigella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		APHA 23 rd Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976



Mr. Nilesh Patel
Sr. Chemist

Mr. Nitin Tandel
Technical Manager

RESULTS OF MARINE WATER [M12 SPM N 22°40'938" E 069°39'191"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.22	8.1	8.14	8.06	8.19	8.07	8.16	8.01	8.12	8.03	8.17	7.96	IS 3025 (Part11)1983
2.	Temperature	°C	30.3	30.1	29.9	29.8	29.7	29.6	29.6	29.5	29.8	29.7	29.9	29.8	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	128	116	114	98	120	102	144	112	128	116	112	84	APHA 23 rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	2.9	BDL	2.8	BDL	2.9	BDL	3.1	BDL	2.7	BDL	3.1	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.02	5.92	6.1	6	6	5.9	5.99	5.89	6.09	5.99	5.83	5.63	APHA 23 rd Ed.,2017,4500-O, B
6.	Salinity	ppt	35.24	36.01	35.22	36.15	35.61	36.24	35.84	36.18	35.94	36.22	36.25	36.98	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39) 1991, Amd. 2
8.	Nitrate as NO ₃	μmol/L	2.67	2.54	2.67	2.33	2.84	2.59	2.76	2.59	2.84	2.59	3.66	3.44	APHA 23 rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO ₂	μmol/L	0.414	0.362	0.325	0.235	0.474	0.31	0.379	0.276	0.474	0.31	0.413	0.379	APHA 23 rd Ed.,2017,4500NO ₂ B
10.	Ammonical Nitrogen as NH ₃	μmol/L	3.4	3.32	2.67	2.58	2.41	1.89	2.32	1.56	2.41	1.89	3.96	3.62	APHA 23 rd Ed., 2017,4500- NH3 B
11.	Phosphates as PO ₄	μmol/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.65	BDL	0.56	BDL	APHA 23 rd Ed.,2017,4500-P, D
12.	Total Nitrogen	μmol/L	6.484	6.222	5.665	5.145	5.724	4.79	5.459	4.426	5.724	4.79	8.033	7.439	APHA 23 rd Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	μg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23 rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	36188	36806	36144	36582	36210	36690	35888	36310	35940	36480	36660	37340	APHA 23 rd Ed.,2017, 2540- C
15.	COD	mg/L	20.04	12.02	24.94	33.25	20.08	12.05	24.12	16.08	20.16	16.13	24.17	20.14	APHA 23 rd Ed.,2017, 5220-B

Continue...

RESULTS OF MARINE WATER [M12 SPM N 22°40'938" E 069°39'191"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A			Phytoplankton												
1.	Chlorophyll	mg/m³	2.11	2.86	2.21	2.86	2.36	2.65	3.26	3.01	2.27	2.89	2.65	3.01	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytn	mg/m³	1.43	0.97	1.87	1.25	0.85	1.49	0.89	1.88	1.11	2.1	1.63	2.44	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10³/L	95	97	102	98	140	127	134	130	134	106	145	152	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	<i>Odontella</i>	<i>Diploneis</i>	<i>Melosira</i>	<i>Nitzschia</i>	<i>Thalassiosira</i>	<i>Melosira</i>	<i>Thalassiosira</i>	<i>Melosira</i>	<i>Dinophysis</i>	<i>Pinnularia</i>	<i>Nitzschia</i>	<i>Nitzschia</i>	APHA (23rd Ed. 2017)10200 F
			<i>Rhizosolenia</i>	<i>Rhizosolenia</i>	<i>Pinnularia</i>	<i>Pinnularia</i>	<i>Melosira</i>	<i>Cyclotella</i>	<i>Melosira</i>	<i>Cyclotella</i>	<i>Pinnularia</i>	<i>Surirella</i>	<i>Pinnularia</i>	<i>Grammatophora</i>	
			<i>Coscinodiscus</i>	<i>Nitzschia</i>	<i>Skeletonema</i>	<i>Odontella</i>	<i>Nitzschia</i>	<i>Odontella</i>	<i>Nitzschia</i>	<i>Odontella</i>	<i>Thalassiothrix</i>	<i>Odontella</i>	<i>Diploneis</i>	<i>Diploneis</i>	
			<i>Grammatophora</i>	<i>Thalassiothrix</i>	<i>Thalassiosira</i>	<i>Dinophysis</i>	<i>Rhizosolenia</i>	<i>Skeletonema</i>	<i>Rhizosolenia</i>	<i>Skeletonema</i>	<i>Grammatophora</i>	<i>Grammatophora</i>	<i>Grammatophora</i>	<i>Thalassiothrix</i>	
			<i>Thalassiosira</i>	<i>Pleurosigma</i>	<i>Thalassionema</i>	<i>Surirella</i>	<i>Pleurosigma</i>	<i>Thalassiosira</i>	<i>Pleurosigma</i>	<i>Thalassiosira</i>	<i>Ceratium</i>	<i>Melosira</i>	<i>Ceratium</i>	<i>Pleurosigma</i>	

B			Zooplankton												
1	Abundance(Population)	noX103 / 100 m ³	40	54	70	72	44	42	APHA (23rd Ed. 2017)10200 G						
2	Name of Group Number and name of group species of each group		<i>Copepods nauplii</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Egg(Fish and Shrimps)</i>							
			<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>							
			<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Copepods nauplii</i>							
			<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Crustacean</i>							
3	Total Biomass	ml/100 m ³	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>							
			16.54	17.36	16.32	16.45	13.25	13.45							

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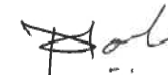
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RESULTS OF MARINE WATER [M12 SPM N 22°40'938" E 069°39'191"]

SR. NO.	TEST PARAMETERS	UNIT	OCTOBER-2022		NOVEMBER-2022		DECEMBER-2022		JANUARY-2023		FEBRUARY-2023		MARCH-2023		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM			
C			Microbiological												
1	Total Bacterial Count	CFU/ml	184		196		210		215		206		222		APHA 23 rd Ed.2017,9215-C
2	Total Coliform	/100ml	49		47		48		51		42		35		APHA 23 rd Ed.2017,9222-B
3	E.coli	/100ml	38		25		23		25		35		23		IS :15185:2016
4	Enterococcus	/100ml	27		20		20		18		22		14		IS:15186:2002
5	Salmonella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS:15187:2016
6	Shigella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		APHA 23 rd Ed.2017,9260-E
7	Vibrio	/100ml	110		142		230		222		212		196		IS: 5887 (Part V):1976



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Sr. Chemist

Mr. Nitin Tandel
Technical Manager

RESULTS OF ETP OUTLET WATER

SR.NO.	TEST PARAMETERS	UNIT	LIQUID TERMINAL						GPCB Limit	TEST METHOD
			OCTOBER-2022	NOVEMBER-2022	DECEMBER-2022	JANUARY-2023	FEBRUARY-2023	MARCH-2023		
			21-10-2022	21-11-2022	28-12-2022	28-01-2023	27-02-2023	29-03-2023		
1.	Colour	Pt. Co. Scale	30	25	30	20	40	50	100	IS 3025(Part 4)
2.	pH @ 27 ° C	--	7.05	7.35	7.24	7.48	6.94	7.08	6.5 to 8.5	APHA 23 rd Ed.,2017,4500-H*B
3.	Temperature	°C	30.5	30	29	28.5	29	29	40	IS 3025(Part 9)1984
4.	Total Suspended Solid	mg/L	36	32	30	34	42	26	100	APHA 23 rd Ed.,2017,2540 –D
5.	Total Dissolved Solids	mg/L	1480	1480	1460	1044	904	990	2100	APHA 23 rd Ed.,2017,2540- C
6.	COD	mg/L	81.1	78.6	86.4	82.4	84.2	80.6	100	IS 3025(Part 58)2006
7.	BOD (3 days at 27 °C)	mg/L	22	21	23	23	23	22	30	IS 3025(Part 44)1993Amd.01
8.	Chloride (as Cl) ⁻	mg/L	539.1	510.4	311.1	410.5	536	443.2	600	IS 3025(PART 32) 1988
9.	Oil & Grease	mg/L	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	10	IS 3025(Part39)1991, Amd. 2
10.	Sulphate (as SO ₄)	mg/L	94	88	33.4	46	110	90	1000	IS 3025(Part 24)1986
11.	Ammonical Nitrogen	mg/L	29.8	25.4	25.3	18.6	22.4	26.8	50	IS 3025(Part 34)1988,
12.	Phenolic Compound	mg/L	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)	1	IS 3025(Part 43)1992, Amd.2
13.	Copper as Cu	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	3	IS 3025(Part 42)1992amd.01,
14.	Lead as Pb	mg/L	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	0.1	APHA 23 rd Ed.,2017,3111-B

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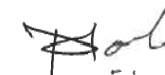
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SR.NO.	TEST PARAMETERS	UNIT	LIQUID TERMINAL						GPCB Limit	TEST METHOD
			OCTOBER-2022	NOVEMBER- 2022	DECEMBER- 2022	JANUARY-2023	FEBRUARY-2023	MARCH-2023		
			21-10-2022	21-11-2022	28-12-2022	28-01-2023	27-02-2023	29-03-2023		
15.	Sulphide as S	mg/L	0.12	0.64	0.6	0.94	0.86	0.58	2	APHA 23 rd Ed., 2017, 4500 S ⁻² F
16.	Cadmium as Cd	mg/L	BDL(MDL:0.003)	BDL(MDL:0.003)	BDL(MDL:0.003)	BDL(MDL:0.003)	BDL(MDL:0.003)	BDL(MDL:0.003)	2	APHA 23 rd Ed., 2017, 3111-B
17.	Fluoride as F	mg/L	0.84	0.64	1.1	1.15	0.94	0.86	2	APHA 23 rd Ed., 2017, 4500 F, D
18.	Residual Chlorine	mg/L	0.75	0.82	0.94	0.86	BDL(MDL:0.1)	0.92	0.5 Min.	APHA 23 rd Ed., 2017, 4500-Cl-B
19.	Percent Sodium	%	45.93	45.32	47.91	47.85	46.99	45.28	60	By Calculation
20.	Sodium Absorption ratio	--	6.5	5.73	4.86	5.03	3.46	3.3	26	By Calculation



Mr. Nilesh Patel
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Mr. Nitin Tandel
Technical Manager

Results of Ambient Air Quality Monitoring

Name of Location		CT3 RMU-2						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	HC µg/m ³	Benzene µg/m ³
1.	03-10-2022	84.41	39.33	22.47	29.33	0.92	NOT DETECTED	NOT DETECTED
2.	06-10-2022	76.53	34.26	19.89	26.34	1.15	NOT DETECTED	NOT DETECTED
3.	10-10-2022	85.65	38.93	26.69	37.18	1.00	NOT DETECTED	NOT DETECTED
4.	13-10-2022	86.38	28.63	34.27	41.13	1.20	NOT DETECTED	NOT DETECTED
5.	17-10-2022	72.97	37.23	31.92	36.48	1.15	NOT DETECTED	NOT DETECTED
6.	20-10-2022	78.29	42.35	23.74	33.63	1.23	NOT DETECTED	NOT DETECTED
7.	27-10-2022	82.36	31.12	26.48	36.82	1.00	NOT DETECTED	NOT DETECTED
8.	28-10-2022	79.19	29.70	34.86	38.62	0.95	NOT DETECTED	NOT DETECTED
9.	31-10-2022	88.69	34.26	29.85	36.73	1.15	NOT DETECTED	NOT DETECTED
10.	03-11-2022	85.45	45.12	17.68	29.34	1.00	2.94	NOT DETECTED
11.	07-11-2022	88.34	44.56	20.14	32.45	0.94	4.69	NOT DETECTED
12.	10-11-2022	86.78	49.12	19.87	34.12	1.15	3.27	NOT DETECTED
13.	14-11-2022	79.23	40.16	20.15	32.45	1.15	4.19	NOT DETECTED
14.	17-11-2022	85.34	47.12	17.89	27.89	1.00	6.83	NOT DETECTED
15.	21-11-2022	83.45	44.56	21.45	31.89	0.95	6.03	NOT DETECTED

Continue...

Name of Location		CT3 RMU-2						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	HC µg/m ³	Benzene µg/m ³
16.	24-11-2022	81.26	39.12	22.17	34.12	1.18	3.35	NOT DETECTED
17.	28-11-2022	83.54	44.23	15.89	28.92	1.05	5.12	NOT DETECTED
18.	01-12-2022	83.26	36.38	24.75	36.68	1.15	4.21	NOT DETECTED
19.	05-12-2022	76.23	39.63	16.92	27.13	1.00	3.27	NOT DETECTED
20.	08-12-2022	85.39	42.39	26.46	32.04	1.19	2.19	NOT DETECTED
21.	12-12-2022	74.62	44.26	24.19	28.46	0.92	2.34	NOT DETECTED
22.	15-12-2022	89.34	37.85	24.74	38.19	1.15	4.31	NOT DETECTED
23.	19-12-2022	82.62	41.05	27.64	37.26	1.14	4.72	NOT DETECTED
24.	22-12-2022	75.44	34.97	16.54	29.91	1.00	4.86	NOT DETECTED
25.	26-12-2022	73.86	37.13	18.62	32.25	1.16	2.64	NOT DETECTED
26.	29-12-2022	87.63	32.57	22.39	36.47	1.00	3.18	NOT DETECTED
27.	02-01-2023	71.69	42.17	27.73	33.18	1.00	2.96	NOT DETECTED
28.	05-01-2023	82.11	32.92	24.84	34.79	1.13	3.26	NOT DETECTED
29.	09-01-2023	87.24	31.29	21.46	27.56	1.00	3.28	NOT DETECTED
30.	12-01-2023	85.24	38.37	28.84	34.1	1.15	2.98	NOT DETECTED
31.	16-01-2023	67.86	27.41	18.27	31.36	1.00	3.17	NOT DETECTED

Continue...

Name of Location		CT3 RMU-2						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	HC µg/m ³	Benzene µg/m ³
32.	19-01-2023	83.02	31.27	22.76	29.14	1.15	3.63	NOT DETECTED
33.	23-01-2023	68.39	38.49	21.27	37.56	1.12	5.72	NOT DETECTED
34.	26-01-2023	86.56	31.28	24.66	36.96	1.19	3.68	NOT DETECTED
35.	30-01-2023	73.42	26.58	28.93	33.41	1.15	2.39	NOT DETECTED
36.	02-02-2023	78.63	34.58	23.73	28.14	1.17	3.28	NOT DETECTED
37.	06-02-2023	64.18	37.16	31.47	39.02	1.00	4.26	NOT DETECTED
38.	09-02-2023	85.3	43.63	27.59	34.61	0.96	3.59	NOT DETECTED
39.	13-02-2023	72.44	31.63	26.56	31.29	1.00	3.73	NOT DETECTED
40.	16-02-2023	87.18	42.16	34.71	41.38	1.14	4.82	NOT DETECTED
41.	20-02-2023	76.28	36.28	31.39	37.86	1.15	2.69	NOT DETECTED
42.	23-02-2023	86.27	34.92	26.37	33.49	1.00	3.61	NOT DETECTED
43.	27-02-2023	71.32	36.47	28.62	32.17	1.12	4.79	NOT DETECTED
44.	02-03-2023	88.48	31.25	27.61	34.05	1.00	3.89	NOT DETECTED
45.	06-03-2023	81.97	43.76	36.28	41.83	1.14	4.79	NOT DETECTED
46.	09-03-2023	85.35	39.68	34.76	39.53	1.17	3.26	NOT DETECTED
47.	13-03-2023	78.12	36.62	29.76	34.14	1.13	3.15	NOT DETECTED

Continue...

Name of Location		CT3 RMU-2						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	HC µg/m ³	Benzene µg/m ³
48.	16-03-2023	86.39	38.11	27.36	32.89	1.00	4.16	NOT DETECTED
49.	20-03-2023	79.83	40.87	33.46	38.95	1.18	3.64	NOT DETECTED
50.	23-03-2023	85.76	42.86	36.14	42.47	1.14	4.28	NOT DETECTED
51.	27-03-2023	72.19	39.76	31.53	37.68	1.00	4.18	NOT DETECTED
52.	30-03-2023	78.84	36.17	28.73	35.66	1.15	3.57	NOT DETECTED
Permissible Value as per NAAQMS		100.0	60.0	80.0	80.0	2.0	---	5.0
Test Method		IS - 5182, Part-23	UERL/AIR/SOP/11	IS - 5182, Part - 2	IS - 5182, Part - 6	IS - 5182, Part - 10	Gas analyzer	IS - 5182, Part - 11



Nikunj D. Patel
(Chemist)




Jaivik S. Tandel
(Manager - Operations)

Results of Ambient Air Quality Monitoring

Name of Location		Near Fire Station						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	HC µg/m ³	Benzene µg/m ³
1.	03-10-2022	87.35	37.24	24.92	32.24	1.00	NOT DETECTED	NOT DETECTED
2.	06-10-2022	72.06	32.21	27.58	34.39	1.15	NOT DETECTED	NOT DETECTED
3.	10-10-2022	82.91	28.36	23.93	28.64	0.92	NOT DETECTED	NOT DETECTED
4.	13-10-2022	75.31	38.95	28.37	37.81	0.95	NOT DETECTED	NOT DETECTED
5.	17-10-2022	83.28	36.82	31.29	38.62	1.10	NOT DETECTED	NOT DETECTED
6.	20-10-2022	83.23	31.06	34.22	41.27	1.14	NOT DETECTED	NOT DETECTED
7.	27-10-2022	79.42	29.24	28.39	36.74	0.90	NOT DETECTED	NOT DETECTED
8.	28-10-2022	81.29	37.86	28.19	32.68	1.15	NOT DETECTED	NOT DETECTED
9.	31-10-2022	88.67	38.72	33.26	39.93	1.00	NOT DETECTED	NOT DETECTED
10.	03-11-2022	81.23	38.76	21.34	26.51	1.00	3.95	NOT DETECTED
11.	07-11-2022	83.45	35.12	18.12	23.45	1.15	4.13	NOT DETECTED
12.	10-11-2022	80.12	30.89	25.23	29.23	0.94	4.74	NOT DETECTED
13.	14-11-2022	73.45	39.76	28.15	33.45	1.10	5.83	NOT DETECTED
14.	17-11-2022	77.34	31.25	25.66	30.12	1.15	3.89	NOT DETECTED
15.	21-11-2022	85.67	43.45	27.35	32.05	0.95	5.64	NOT DETECTED

Continue...

Name of Location		Near Fire Station						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	HC µg/m ³	Benzene µg/m ³
16.	24-11-2022	82.45	38.12	23.45	28.45	1.13	3.68	NOT DETECTED
17.	28-11-2022	73.45	29.53	27.15	32.45	1.15	4.13	NOT DETECTED
18.	01-12-2022	73.28	43.39	17.2	21.63	1.18	2.64	NOT DETECTED
19.	05-12-2022	78.64	39.17	24.36	32.87	1.00	2.39	NOT DETECTED
20.	08-12-2022	87.32	34.53	28.61	37.27	1.16	3.18	NOT DETECTED
21.	12-12-2022	82.59	44.16	21.67	31.46	1.00	4.4	NOT DETECTED
22.	15-12-2022	71.36	37.49	27.36	35.97	1.15	4.33	NOT DETECTED
23.	19-12-2022	89.61	36.83	29.72	38.49	1.15	2.97	NOT DETECTED
24.	22-12-2022	68.42	41.06	28.48	33.74	1.12	5.27	NOT DETECTED
25.	26-12-2022	78.26	36.11	24.17	29.55	1.00	2.41	NOT DETECTED
26.	29-12-2022	73.47	39.58	26.74	34.16	1.12	3.79	NOT DETECTED
27.	02-01-2023	87.55	29.38	14.45	27.52	1.00	3.73	NOT DETECTED
28.	05-01-2023	73.18	31.84	28.63	28.48	1.13	4.18	NOT DETECTED
29.	09-01-2023	64.83	38.61	21.99	34.17	1.15	2.48	NOT DETECTED
30.	12-01-2023	87.36	35.26	26.28	31.63	1.12	3.28	NOT DETECTED
31.	16-01-2023	69.58	27.42	31.24	39.29	1.00	3.77	NOT DETECTED

Continue...

Name of Location		Near Fire Station						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	HC µg/m ³	Benzene µg/m ³
32.	19-01-2023	81.27	31.48	23.59	36.92	1.00	3.39	NOT DETECTED
33.	23-01-2023	70.92	34.57	29.89	38.56	1.15	2.58	NOT DETECTED
34.	26-01-2023	79.68	29.72	16.27	24.36	1.14	3.85	NOT DETECTED
35.	30-01-2023	73.29	32.96	31.36	38.84	1.00	2.14	NOT DETECTED
36.	02-02-2023	76.38	31.62	18.14	21.28	0.92	3.27	NOT DETECTED
37.	06-02-2023	88.17	24.29	33.73	43.44	1.00	3.72	NOT DETECTED
38.	09-02-2023	71.63	31.62	27.38	39.74	1.12	3.86	NOT DETECTED
39.	13-02-2023	69.74	27.63	21.92	27.53	1.00	2.18	NOT DETECTED
40.	16-02-2023	85.41	39.84	28.66	32.19	1.17	4.52	NOT DETECTED
41.	20-02-2023	62.18	36.62	31.39	43.65	0.95	2.18	NOT DETECTED
42.	23-02-2023	75.37	28.18	19.32	26.17	1.00	4.38	NOT DETECTED
43.	27-02-2023	83.56	33.69	26.18	37.51	1.16	2.95	NOT DETECTED
44.	02-03-2023	84.38	26.15	23.89	31.27	1.14	3.57	NOT DETECTED
45.	06-03-2023	73.81	29.27	26.64	35.86	1	4.13	NOT DETECTED
46.	09-03-2023	89.64	39.55	34.28	42.46	0.96	4.27	NOT DETECTED
47.	13-03-2023	82.57	36.39	31.67	37.16	1.15	3.19	NOT DETECTED

Continue...

Name of Location		Near Fire Station						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	HC µg/m ³	Benzene µg/m ³
48.	16-03-2023	89.79	34.18	28.36	35.13	1.12	4.25	NOT DETECTED
49.	20-03-2023	77.73	39.13	34.88	41.29	1.00	2.69	NOT DETECTED
50.	23-03-2023	74.52	35.07	23.18	31.44	1.14	3.56	NOT DETECTED
51.	27-03-2023	85.36	37.48	29.67	34.89	1.1	3.21	NOT DETECTED
52.	30-03-2023	81.29	41.35	32.58	38.1	1.17	4.24	NOT DETECTED
Permissible Value as per NAAQMS		100.0	60.0	80.0	80.0	2.0	---	5.0
Test Method		IS - 5182, Part-23	UERL/AIR/SOP/11	IS - 5182, Part - 2	IS - 5182, Part - 6	IS - 5182, Part - 10	Gas analyzer	IS - 5182, Part - 11



Nikunj D. Patel
(Chemist)




Jaivik S. Tandel
(Manager - Operations)

Results of Ambient Air Quality Monitoring

Name of Location		ADANI PORT – TUG Berth 600 KL Pupm House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	HC µg/m ³	Benzene µg/m ³
1.	03-10-2022	83.26	32.68	21.38	34.27	1.00	NOT DETECTED	NOT DETECTED
2.	06-10-2022	79.54	36.82	26.32	34.86	1.12	NOT DETECTED	NOT DETECTED
3.	10-10-2022	88.31	33.96	28.64	34.72	1.00	NOT DETECTED	NOT DETECTED
4.	13-10-2022	78.47	29.81	29.94	41.65	0.95	NOT DETECTED	NOT DETECTED
5.	17-10-2022	83.27	27.38	32.16	39.89	1.00	NOT DETECTED	NOT DETECTED
6.	20-10-2022	82.86	36.32	24.28	27.13	1.15	NOT DETECTED	NOT DETECTED
7.	27-10-2022	69.89	38.24	31.46	39.03	1.00	NOT DETECTED	NOT DETECTED
8.	28-10-2022	79.84	27.38	19.24	26.86	0.95	NOT DETECTED	NOT DETECTED
9.	31-10-2022	81.29	29.17	32.23	37.2	1.00	NOT DETECTED	NOT DETECTED
10.	03-11-2022	86.78	37.65	22.43	28.25	1.00	2.97	NOT DETECTED
11.	07-11-2022	83.45	43.45	24.14	30.25	1.09	4.28	NOT DETECTED
12.	10-11-2022	88.76	44.12	21.34	27.12	1.15	3.16	NOT DETECTED
13.	14-11-2022	83.45	45.67	25.67	32.45	1.00	6.79	NOT DETECTED
14.	17-11-2022	80.68	37.83	26.74	33.89	1.12	3.57	NOT DETECTED
15.	21-11-2022	84.21	36.46	22.35	28.95	0.95	2.86	NOT DETECTED

Continue...

Name of Location		ADANI PORT – TUG Berth 600 KL Pupm House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	HC µg/m ³	Benzene µg/m ³
16.	24-11-2022	86.53	43.15	27.69	35.15	1.00	3.29	NOT DETECTED
17.	28-11-2022	83.24	40.15	22.45	27.86	0.94	4.69	NOT DETECTED
18.	01-12-2022	72.18	31.63	28.46	35.27	1.15	3.14	NOT DETECTED
19.	05-12-2022	85.42	37.89	21.75	32.84	1.00	3.28	NOT DETECTED
20.	08-12-2022	83.81	41.52	26.34	38.91	1.00	2.68	NOT DETECTED
21.	12-12-2022	88.57	37.6	29.49	31.06	1.17	4.52	NOT DETECTED
22.	15-12-2022	86.77	34.28	19.96	26.43	0.94	2.16	NOT DETECTED
23.	19-12-2022	76.23	46.16	27.28	37.67	1.13	4.66	NOT DETECTED
24.	22-12-2022	82.94	38.58	32.13	39.64	1.00	2.79	NOT DETECTED
25.	26-12-2022	86.41	34.24	28.44	34.59	1.15	3.83	NOT DETECTED
26.	29-12-2022	79.67	36.79	23.46	31.37	1.00	2.65	NOT DETECTED
27.	02-01-2023	66.17	36.24	21.45	32.19	1.12	2.37	NOT DETECTED
28.	05-01-2023	79.46	27.52	16.38	28.74	1.00	2.96	NOT DETECTED
29.	09-01-2023	74.61	36.74	29.64	36.78	1.15	3.17	NOT DETECTED
30.	12-01-2023	76.24	32.82	24.79	39.83	1.00	2.68	NOT DETECTED
31.	16-01-2023	82.47	27.17	27.54	19.99	1.00	4.27	NOT DETECTED

Continue...

Name of Location		ADANI PORT – TUG Berth 600 KL Pupm House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	HC µg/m ³	Benzene µg/m ³
32.	19-01-2023	78.52	39.36	26.17	28.14	1.15	3.95	NOT DETECTED
33.	23-01-2023	85.35	31.24	24.39	31.57	1.12	4.68	NOT DETECTED
34.	26-01-2023	78.31	38.57	26.73	33.87	1.00	2.52	NOT DETECTED
35.	30-01-2023	87.49	29.63	25.44	36.26	1.17	3.47	NOT DETECTED
36.	02-02-2023	83.26	31.59	16.72	24.14	1.15	3.62	NOT DETECTED
37.	06-02-2023	86.72	37.52	28.68	36.89	0.95	3.79	NOT DETECTED
38.	09-02-2023	67.38	44.74	34.54	41.38	1.00	4.62	NOT DETECTED
39.	13-02-2023	75.18	38.57	29.84	37.49	1.14	3.96	NOT DETECTED
40.	16-02-2023	81.38	36.62	26.81	29.75	1.00	2.85	NOT DETECTED
41.	20-02-2023	80.32	31.28	33.49	38.16	1.13	2.59	NOT DETECTED
42.	23-02-2023	74.91	37.26	28.81	36.57	0.97	3.66	NOT DETECTED
43.	27-02-2023	87.74	35.96	31.63	38.27	1.00	3.74	NOT DETECTED
44.	02-03-2023	70.69	42.58	23.34	29.75	1.00	3.88	NOT DETECTED
45.	06-03-2023	87.43	44.51	32.74	39.46	1.14	4.15	NOT DETECTED
46.	09-03-2023	76.57	37.59	28.17	34.15	1.12	4.86	NOT DETECTED
47.	13-03-2023	72.45	34.21	31.42	38.76	1.00	2.98	NOT DETECTED

Continue...

Name of Location		ADANI PORT – TUG Berth 600 KL Pupm House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	HC µg/m ³	Benzene µg/m ³
48.	16-03-2023	78.82	39.76	29.57	32.56	1.12	3.12	NOT DETECTED
49.	20-03-2023	87.05	42.95	32.47	41.2	1.15	3.26	NOT DETECTED
50.	23-03-2023	85.26	34.18	30.88	38.65	1.00	4.62	NOT DETECTED
51.	27-03-2023	74.24	38.65	29.74	34.71	1.13	4.42	NOT DETECTED
52.	30-03-2023	83.28	32.41	24.25	29.48	1.15	3.78	NOT DETECTED
Permissible Value as per NAAQMS		100.0	60.0	80.0	80.0	2.0	---	5.0
Test Method		IS - 5182, Part-23	UERL/AIR/SOP/11	IS - 5182, Part - 2	IS - 5182, Part - 6	IS - 5182, Part - 10	Gas analyzer	IS – 5182, Part – 11



Nikunj D. Patel
(Chemist)




Jaivik S. Tandel
(Manager - Operations)

Results of Ambient Air Quality Monitoring

Name of Location		PUB / Adani House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	HC µg/m ³	Benzene µg/m ³
1.	03-10-2022	79.37	28.34	17.38	26.86	0.92	NOT DETECTED	NOT DETECTED
2.	06-10-2022	83.47	36.86	19.63	23.26	1.15	NOT DETECTED	NOT DETECTED
3.	10-10-2022	82.38	32.12	17.88	29.10	1.00	NOT DETECTED	NOT DETECTED
4.	13-10-2022	73.48	29.73	18.39	26.24	1.12	NOT DETECTED	NOT DETECTED
5.	17-10-2022	84.32	26.46	24.96	31.82	1.00	NOT DETECTED	NOT DETECTED
6.	20-10-2022	88.74	37.94	23.58	29.39	1.10	NOT DETECTED	NOT DETECTED
7.	27-10-2022	75.93	23.63	29.34	37.43	0.96	NOT DETECTED	NOT DETECTED
8.	28-10-2022	81.29	32.45	22.25	31.98	1.13	NOT DETECTED	NOT DETECTED
9.	31-10-2022	78.64	39.41	31.48	38.71	1.00	NOT DETECTED	NOT DETECTED
10.	03-11-2022	83.21	27.43	11.24	16.78	1.00	4.72	NOT DETECTED
11.	07-11-2022	78.23	21.25	14.78	20.15	1.15	3.29	NOT DETECTED
12.	10-11-2022	65.78	31.16	17.89	24.56	0.94	5.63	NOT DETECTED
13.	14-11-2022	77.58	22.47	23.45	31.36	1.00	5.09	NOT DETECTED
14.	17-11-2022	81.24	26.28	26.78	30.15	1.00	4.37	NOT DETECTED
15.	21-11-2022	83.45	34.56	23.10	28.15	1.15	4.86	NOT DETECTED

Continue...

Name of Location		PUB / Adani House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	HC µg/m ³	Benzene µg/m ³
16.	24-11-2022	73.45	28.51	22.45	27.14	0.95	2.98	NOT DETECTED
17.	28-11-2022	80.12	23.83	19.25	22.53	1.00	4.12	NOT DETECTED
18.	01-12-2022	84.42	23.57	16.38	26.47	1.16	3.72	NOT DETECTED
19.	05-12-2022	68.54	21.75	19.43	25.79	1.00	4.76	NOT DETECTED
20.	08-12-2022	82.71	24.17	26.19	34.27	1.10	4.88	NOT DETECTED
21.	12-12-2022	76.83	29.96	28.77	37.36	1.13	4.26	NOT DETECTED
22.	15-12-2022	86.53	32.78	21.91	27.52	1.00	3.57	NOT DETECTED
23.	19-12-2022	83.36	31.26	27.62	33.13	1.16	3.72	NOT DETECTED
24.	22-12-2022	79.16	34.04	25.12	31.98	1.00	3.14	NOT DETECTED
25.	26-12-2022	73.58	29.36	22.65	29.07	1.00	3.64	NOT DETECTED
26.	29-12-2022	85.63	36.42	26.83	36.17	1.15	4.12	NOT DETECTED
27.	02-01-2023	72.36	29.62	13.28	31.34	1.00	2.96	NOT DETECTED
28.	05-01-2023	84.27	24.38	26.73	34.86	1.12	3.59	NOT DETECTED
29.	09-01-2023	81.63	27.47	17.38	26.47	1.00	3.26	NOT DETECTED
30.	12-01-2023	75.38	37.24	26.77	32.14	1.00	4.83	NOT DETECTED
31.	16-01-2023	87.31	26.48	16.64	27.92	1.15	4.89	NOT DETECTED

Continue...

Name of Location		PUB / Adani House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	HC µg/m ³	Benzene µg/m ³
32.	19-01-2023	64.38	39.63	21.94	31.23	1.13	3.26	NOT DETECTED
33.	23-01-2023	73.29	32.47	29.58	38.96	1.17	2.13	NOT DETECTED
34.	26-01-2023	69.04	36.72	26.16	37.53	1.13	2.79	NOT DETECTED
35.	30-01-2023	84.27	27.84	18.24	26.48	1.12	3.74	NOT DETECTED
36.	02-02-2023	89.28	34.79	23.85	27.13	1.17	4.83	NOT DETECTED
37.	06-02-2023	73.59	29.82	21.29	29.75	1.00	2.37	NOT DETECTED
38.	09-02-2023	86.27	39.84	32.06	43.27	1.17	4.72	NOT DETECTED
39.	13-02-2023	77.33	32.61	31.29	37.55	0.95	2.79	NOT DETECTED
40.	16-02-2023	76.52	31.28	24.66	31.74	1.00	3.16	NOT DETECTED
41.	20-02-2023	63.38	34.39	28.17	37.93	1.00	4.33	NOT DETECTED
42.	23-02-2023	88.56	41.39	23.72	33.84	1.15	3.69	NOT DETECTED
43.	27-02-2023	73.41	38.69	31.43	36.16	1.00	3.48	NOT DETECTED
44.	02-03-2023	75.41	40.62	27.17	34.29	0.95	4.03	NOT DETECTED
45.	06-03-2023	86.36	36.17	25.74	31.58	0.98	3.12	NOT DETECTED
46.	09-03-2023	78.72	32.96	24.68	28.49	1.14	4.18	NOT DETECTED
47.	13-03-2023	74.17	41.22	28.54	35.25	1.12	2.96	NOT DETECTED

Continue...

Name of Location		PUB / Adani House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	HC µg/m ³	Benzene µg/m ³
48.	16-03-2023	84.23	36.71	28.16	34.86	1.00	3.55	NOT DETECTED
49.	20-03-2023	88.98	42.58	31.32	39.13	1.12	3.75	NOT DETECTED
50.	23-03-2023	76.63	35.93	29.65	36.29	1.00	4.25	NOT DETECTED
51.	27-03-2023	86.24	31.47	26.96	31.83	1.14	3.38	NOT DETECTED
52.	30-03-2023	89.58	38.25	19.63	25.58	1.11	3.15	NOT DETECTED
Permissible Value as per NAAQMS		100.0	60.0	80.0	80.0	2.0	---	5.0
Test Method		IS - 5182, Part-23	UERL/AIR/SOP/11	IS - 5182, Part - 2	IS - 5182, Part - 6	IS - 5182, Part - 10	Gas analyzer	IS - 5182, Part - 11



Nikunj D. Patel
(Chemist)




Jaivik S. Tandel
(Manager - Operations)

Results of Noise Level Monitoring

Location Name		CT3 RMU-2					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Day Time					
		13-10-2022	14-11-2022	12-12-2022	12-01-2023	13-02-2023	13-03-2023
1	06:00 to 07:00	63.4	62.8	61.2	59.9	61.9	64.6
2	07:00 to 08:00	66.9	68.5	63.8	61.4	68.5	68.2
3	08:00 to 09:00	63.2	67.4	62.8	68.6	64.7	66.7
4	09:00 to 10:00	69.6	64.7	64.3	65.5	62.1	64.9
5	10:00 to 11:00	61.2	64.1	68.5	66.1	67.5	63.6
6	11:00 to 12:00	67.4	68.9	69.1	69.1	65.7	64.2
7	12:00 to 13:00	68.8	67.1	64.2	64.2	62.4	64.9
8	13:00 to 14:00	67.5	68.3	66.9	68.3	69.0	68.7
9	14:00 to 15:00	65.2	64.2	63.6	63.6	64.2	63.6
10	15:00 to 16:00	69.5	62.3	64.2	62.6	62.3	61.9
11	16:00 to 17:00	65.5	69.4	63.9	63.9	68.6	68.4
12	17:00 to 18:00	68.2	61.2	66.8	62.9	61.2	67.4
13	18:00 to 19:00	68.7	68.4	64.4	63.7	67.2	63.4
14	19:00 to 20:00	65.5	65.5	63.6	62.2	65.5	62.7
15	20:00 to 21:00	60.7	65.4	65.4	65.4	63.4	60.5
16	21:00 to 22:00	62.9	64.8	63.1	62.7	64.7	63.8
Day Time		<75 dB (A)					

Continue...

Location Name		CT3 RMU-2					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) – Night Time					
		13-10-2022	14-11-2022	12-12-2022	12-01-2023	13-02-2023	13-03-2023
1	22:00 to 23:00	62.4	59.2	59.6	59.0	60.3	62.4
2	23:00 to 24:00	63.1	62.5	60.3	60.8	61.3	60.5
3	24:00 to 01:00	57.5	61.2	63.2	62.2	61.2	58.5
4	01:00 to 02:00	61.1	57.9	61.7	60.8	57.4	59.3
5	02:00 to 03:00	62.7	57.4	62.1	62.1	58.3	56.8
6	03:00 to 04:00	60.9	60.2	60.4	60.4	61.9	60.9
7	04:00 to 05:00	58.4	61.8	64.5	63.1	61.8	62.6
8	05:00 to 06:00	59.9	63.9	62.5	61.9	58.6	60.7
Night Time		<70 dB (A)					

Test Method	IS: 9989 : 1981
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Nikunj D. Patel
(Chemist)




Jaivik S. Tandel
(Manager - Operations)

Results of Noise Level Monitoring

Location Name		Near Fire Station					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Day Time					
		06-10-2022	07-11-2022	05-12-2022	05-01-2023	06-02-2023	06-03-2023
1	06:00 to 07:00	63.5	63.4	62.3	61.4	64.8	61.9
2	07:00 to 08:00	64.3	67.8	63.6	66.8	61.6	63.6
3	08:00 to 09:00	66.7	69.3	67.2	65.3	68.4	67.3
4	09:00 to 10:00	62.8	61.3	63.0	67.5	65.3	66.8
5	10:00 to 11:00	68.1	65.1	64.4	61.3	68.1	63.2
6	11:00 to 12:00	63.2	68.3	66.8	62.8	67.2	65.1
7	12:00 to 13:00	64.2	68.9	65.9	62.9	64.7	67.3
8	13:00 to 14:00	66.9	66.7	63.5	61.4	68.3	68.1
9	14:00 to 15:00	61.2	58.7	68.2	66.3	59.7	60.2
10	15:00 to 16:00	64.8	67.5	62.6	65.7	68.4	65.3
11	16:00 to 17:00	63.1	66.3	67.9	67.9	67.7	68.3
12	17:00 to 18:00	60.8	67.1	61.4	64.7	61.0	63.2
13	18:00 to 19:00	66.9	65.9	66.8	62.4	66.3	67.5
14	19:00 to 20:00	61.3	64.2	64.2	64.2	65.1	63.9
15	20:00 to 21:00	63.3	63.2	62.1	64.1	64.8	63.2
16	21:00 to 22:00	58.7	61.3	61.3	63.6	62.6	64.8
Day Time		<75 dB (A)					

Continue...

Location Name		Near Fire Station					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Night Time					
		06-10-2022	07-11-2022	05-12-2022	05-01-2023	06-02-2023	06-03-2023
1	22:00 to 23:00	59.2	58.6	60.9	58.4	56.8	54.8
2	23:00 to 24:00	62.5	57.8	61.3	61.3	58.4	56.6
3	24:00 to 01:00	62.3	61.2	59.6	59.3	60.2	58.5
4	01:00 to 02:00	57.9	59.8	61.3	60.2	56.4	57.4
5	02:00 to 03:00	60.3	60.4	59.8	59.8	57.3	58.4
6	03:00 to 04:00	62.4	58.6	60.3	61.3	61.3	60.4
7	04:00 to 05:00	61.5	61.3	59.5	59.5	60.2	58.7
8	05:00 to 06:00	61.7	59.8	58.6	58.1	59.8	55.2
Night Time		<70 dB (A)					

Test Method	IS: 9989 : 1981
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Nikunj D. Patel
(Chemist)




Jaivik S. Tandel
(Manager - Operations)

Results of Noise Level Monitoring

Location Name		ADANI PORT – TUG Berth 600 KL Pump House					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Day Time					
		10-10-2022	10-11-2022	08-12-2022	09-01-2023	09-02-2023	09-03-2023
1	06:00 to 07:00	63.8	61.3	59.7	62.3	63.1	62.7
2	07:00 to 08:00	65.4	65.4	62.7	64.8	64.4	61.3
3	08:00 to 09:00	61.2	67.3	63.9	61.8	66.3	64.8
4	09:00 to 10:00	67.4	64.3	63.2	62.3	67.5	68.3
5	10:00 to 11:00	63.3	68.9	68.6	65.9	67.9	64.7
6	11:00 to 12:00	68.8	67.3	63.6	68.1	68.4	67.5
7	12:00 to 13:00	67.2	64.3	68.1	67.4	62.1	64.8
8	13:00 to 14:00	61.5	67.1	65.4	68.2	68.3	67.2
9	14:00 to 15:00	67.1	66.2	61.3	65.8	65.3	67.9
10	15:00 to 16:00	60.4	69.8	64.9	64.9	68.1	66.5
11	16:00 to 17:00	62.6	68.2	67.4	67.4	67.4	68.3
12	17:00 to 18:00	68.2	65.3	67.3	64.2	61.7	62.5
13	18:00 to 19:00	68.1	66.4	66.2	66.2	64.3	66.8
14	19:00 to 20:00	65.2	61.3	69.7	69.7	63.2	64.1
15	20:00 to 21:00	64.1	64.3	64.8	64.8	65.8	63.8
16	21:00 to 22:00	62.3	63.9	63.4	58.4	62.8	60.9
Day Time		<75 dB (A)					

Continue...

Location Name		ADANI PORT – TUG Berth 600 KL Pump House					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Night Time					
		10-10-2022	10-11-2022	08-12-2022	09-01-2023	09-02-2023	09-03-2023
1	22:00 to 23:00	60.8	61.4	61.2	61.2	58.5	56.7
2	23:00 to 24:00	63.5	62.3	61.8	61.8	61.8	60.4
3	24:00 to 01:00	63.8	56.8	62.3	62.8	56.8	57.2
4	01:00 to 02:00	62.7	59.5	60.9	60.7	58.5	57.7
5	02:00 to 03:00	60.6	56.5	60.3	61.4	56.5	58.5
6	03:00 to 04:00	61.4	58.8	61.5	61.5	57.3	58.5
7	04:00 to 05:00	58.7	60.7	63.8	64.5	60.7	58.4
8	05:00 to 06:00	54.7	61.4	62.4	62.7	62.4	59.9
Day Time		<70 dB (A)					

Test Method	IS: 9989 : 1981
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Nikunj D. Patel
(Chemist)




Jaivik S. Tandel
(Manager - Operations)

Results of Noise Level Monitoring

Location Name		PUB/Adani House					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Day Time					
		03-10-2022	03-11-2022	01-12-2022	02-01-2023	02-02-2023	02-03-2023
1	06:00 to 07:00	62.5	63.8	62.7	61.8	60.6	62.4
2	07:00 to 08:00	66.1	61.4	64.2	63.5	62.5	61.8
3	08:00 to 09:00	68.2	58.7	63.1	62.8	60.9	63.7
4	09:00 to 10:00	62.4	62.6	65.6	62.4	63.2	63.2
5	10:00 to 11:00	67.8	68.7	64.2	63.4	67.4	64.2
6	11:00 to 12:00	64.0	63.4	67.9	69.6	65.2	61.8
7	12:00 to 13:00	61.3	69.7	64.3	65.7	68.9	65.9
8	13:00 to 14:00	65.9	62.1	63.2	64.2	64.8	63.1
9	14:00 to 15:00	64.2	62.5	66.5	67.5	63.6	66.3
10	15:00 to 16:00	63.7	61.8	65.2	67.1	61.8	62.9
11	16:00 to 17:00	67.0	65.5	64.5	63.8	66.4	64.7
12	17:00 to 18:00	65.3	64.1	65.1	64.9	67.9	64.3
13	18:00 to 19:00	69.1	59.2	62.7	63.8	58.2	60.1
14	19:00 to 20:00	66.7	68.3	61.3	65.4	67.0	63.4
15	20:00 to 21:00	61.8	63.3	60.2	63.9	61.9	62.7
16	21:00 to 22:00	60.4	66.3	60.8	62.5	65.3	61.2
Day Time		<75 dB (A)					

Continue...

Location Name		PUB/Adani House					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Night Time					
		03-10-2022	03-11-2022	01-12-2022	02-01-2023	02-02-2023	02-03-2023
1	22:00 to 23:00	63.6	56.3	58.7	60.3	57.3	58.4
2	23:00 to 24:00	64.2	57.8	61.6	62.3	56.2	54.2
3	24:00 to 01:00	63.4	54.3	60.7	59.8	54.3	55.7
4	01:00 to 02:00	64.1	58.6	60.6	60.6	57.4	58.3
5	02:00 to 03:00	58.6	59.3	59.3	58.1	60.1	59.2
6	03:00 to 04:00	58.2	55.8	60.5	59.2	56.3	57.9
7	04:00 to 05:00	64.2	59.2	61.3	60.5	59.2	55.4
8	05:00 to 06:00	61.3	57.4	62.7	61.3	58.3	57.8
Day Time		<70 dB (A)					

Test Method	IS: 9989 : 1981
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Nikunj D. Patel
(Chemist)




Jaivik S. Tandel
(Manager - Operations)

Results of Stack Monitoring								
Sr. No.	Parameter	Unit	Hot Water System-1 (Liquid Terminal)	Hot Water System-2 (Liquid Terminal)	Thermic Fluid Heater (Bitumin-1)	Thermic Fluid Heater (Bitumin-2)	GPCB LIMIT	Method of Test
Oct-22								
1	Particulate Matter	mg/Nm ³	21.19	23.64	23.72	22.96	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO ₂	ppm	6.63	7.24	9.03	9.84	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO _x	ppm	18.47	23.36	22.38	21.29	50	IS 11255 (Part - 7)
Nov-22								
1	Particulate Matter	mg/Nm ³	22.79	21.44	22.37	21.47	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO ₂	ppm	7.26	6.63	8.69	8.32	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO _x	ppm	20.19	21.79	21.52	22.16	50	IS 11255 (Part - 7)
Dec-22								
1	Particulate Matter	mg/Nm ³	22.48	22.92	22.89	22.36	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO ₂	ppm	6.84	6.89	9.08	9.16	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO _x	ppm	19.72	22.31	22.14	22.68	50	IS 11255 (Part - 7)
Jan-23								
1	Particulate Matter	mg/Nm ³	22.83	23.18	23.48	22.79	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO ₂	ppm	7.12	7.13	9.83	9.58	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO _x	ppm	21.26	22.58	22.94	23.13	50	IS 11255 (Part - 7)

Continue...

Sr. No.	Parameter	Unit	Hot Water System-1 (Liquid Terminal)	Hot Water System-2 (Liquid Terminal)	Thermic Fluid Heater (Bitumin-1)	Thermic Fluid Heater (Bitumin-2)	GPCB LIMIT	Method of Test
Feb-23								
1	Particulate Matter	mg/Nm ³	21.36	22.39	21.72	19.79	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO ₂	ppm	6.27	7.58	8.36	8.68	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO _x	ppm	19.89	22.94	20.52	21.56	50	IS 11255 (Part - 7)
Mar-23								
1	Particulate Matter	mg/Nm ³	21.14	21.85	19.38	18.78	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO ₂	ppm	6.58	7.32	8.14	7.46	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO _x	ppm	20.36	22.58	19.69	20.83	50	IS 11255 (Part - 7)



Nikunj D. Patel
(Chemist)




Jaivik S. Tandel
(Manager - Operations)

Results of Stack Monitoring									
Sr. No.	Parameter	Unit	D.G. Set-6, 7 & 8 (1250 KVA - CT2) Common Stack	D.G. Set-9 (1500 KVA - CT3)	D.G. Set-10 (1500 KVA - CT3)	D.G. Set-11 (1500 KVA - CT3)	GPCB LIMIT	Method of Test	
			Mar-23	Feb-23					
			17-03-2023	03-02-2023	03-02-2023	03-02-2023			
1	Particulate Matter	mg/Nm ³	22.48	13.49	17.28	14.96	150	IS 11255 (Part - 1)	
2	Sulphur Dioxide as SO ₂	ppm	8.26	9.84	13.63	13.37	100	IS 11255 (Part - 2)	
3	Oxides of Nitrogen as NO _x	ppm	17.85	21.69	24.71	17.81	50	IS 11255 (Part - 7)	
4	Carbon Monoxide	mg/Nm3	3.27	4.6	4.8	4.2	--	UERL/AIR/SOP/18	
5	Non Methyl Hydro Carbon	ppm	Not Detected	Not Detected	Not Detected	Not Detected	--	UERL/AIR/SOP/27	
Sr. No.	Parameter	Unit	D.G. Set-12 (1500 KVA) - CT4	D.G. Set-13 (1500 KVA) - CT4	D.G. Set-14 (1500 KVA) - CT4	D.G. Set-1 (500 KVA) - DG House - MPT	GPCB LIMIT	Method of Test	
			Feb-23						Dec-22
			01-02-2023	01-02-2023	01-02-2023	18-12-2022			
1	Particulate Matter	mg/Nm ³	19.27	22.39	19.36	18.73	150	IS 11255 (Part - 1)	
2	Sulphur Dioxide as SO ₂	ppm	7.84	8.68	7.73	7.42	100	IS 11255 (Part - 2)	
3	Oxides of Nitrogen as NO _x	ppm	15.96	19.52	15.24	24.38	50	IS 11255 (Part - 7)	
4	Carbon Monoxide	mg/Nm3	4.13	4.46	3.92	2.69	--	UERL/AIR/SOP/18	
5	Non Methyl Hydro Carbon	ppm	Not Detected	Not Detected	Not Detected	Not Detected	--	UERL/AIR/SOP/27	

Continue...

Sr. No.	Parameter	Unit	D.G. Set-2 (500 KVA) - DG House - MPT	D.G. Set-3 (500 KVA) - DG House - MPT	D.G. Set-4 (500 KVA) - DG House - MPT	D.G. Set-5 (500 KVA) - DG House - MPT	GPCB LIMIT	Method of Test
			Dec-22					
			18-12-2022	18-12-2022	18-12-2022	18-12-2022		
1	Particulate Matter	mg/Nm ³	23.74	21.47	26.68	23.74	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO ₂	ppm	6.84	9.39	8.36	9.37	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO _x	ppm	26.72	27.51	26.64	28.58	50	IS 11255 (Part - 7)
4	Carbon Monoxide	mg/Nm3	3.26	4.17	4.79	4.15	--	UERL/AIR/SOP/18
5	Non Methyl Hydro Carbon	ppm	Not Detected	Not Detected	Not Detected	Not Detected	--	UERL/AIR/SOP/27



Nikunj D. Patel
(Chemist)



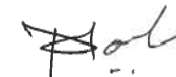

Jaivik S. Tandel
(Manager - Operations)

RESULTS OF BORE HOLE WATER

SR.NO.	TEST PARAMETERS	UNIT	Pump House-1	Pump House-2	Pump House-3	Near Unloading bays	Near ETP	TEST METHOD
			14-02-2023	14-02-2023	14-02-2023	14-02-2023	14-02-2023	
1.	pH @ 25 ° C	--	8.11	7.78	7.89	7.98	8.01	IS 3025(Part 11)1983
2.	Salinity	ppt	3.37	1.06	1.81	1.02	7.17	APHA 23 rd Ed.,2017,2520 B
3.	Oil & Grease	mg/L	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	IS 3025(Part39)1991, Amd. 2
4.	Hydrocarbon	mg/L	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	GC/GCMS
5.	Lead as Pb	mg/L	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	IS 3025 (PART 47) 1994
6.	Arsenic as As	mg/L	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	APHA 23 rd Ed.,2017,3114-C
7.	Nickel as Ni	mg/L	0.076	0.022	0.033	0.015	0.127	IS 3025 (PART 54) 2003
8.	Total Chromium as Cr	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	IS 3025 (PART 52) 2003
9.	Cadmium as Cd	mg/L	0.042	BDL(MDL:0.003)	BDL(MDL:0.003)	BDL(MDL:0.003)	0.094	IS 3025(PART 41) 1992
10.	Mercury as Hg	mg/L	BDL(MDL:0.001)	BDL(MDL:0.001)	BDL(MDL:0.001)	BDL(MDL:0.001)	BDL(MDL:0.001)	APHA 23 rd Ed.,2017, 3112-B
11.	Zinc as Zn	mg/L	0.102	0.061	BDL(MDL:0.05)	BDL(MDL:0.05)	0.054	IS 3025(PART 49) 1994
12.	Copper as Cu	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	IS 3025 (PART 42) 1992
13.	Iron as Fe	mg/L	0.835	0.516	BDL(MDL:0.1)	BDL(MDL:0.1)	0.342	IS 3025(PART 53) 2003
14.	Insecticides/Pesticides	µg/L	Absent	Absent	Absent	Absent	Absent	USEPA 8081 B
15.	Depth of Water Level from Ground Level	meter	1.9	2.1	1.95	2.15	2	--



Mr. Nilesh Patel
Sr. Chemist

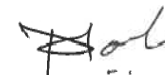
Mr. Nitin Tandel
Technical Manager

RESULTS OF BORE HOLE WATER

SR.NO.	TEST PARAMETERS	UNIT	Pump House-1	Pump House-2	Pump House-3	Near Unloading bays	Near ETP	TEST METHOD
			04-08-2022	04-08-2022	04-08-2022	04-08-2022	04-08-2022	
1.	pH @ 25 ° C	--	8.44	8.02	8.06	7.79	7.6	IS 3025(Part 11)1983
2.	Salinity	ppt	3.4	0.79	0.81	1.12	11.64	APHA 23 rd Ed.,2017,2520 B
3.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39)1991, Amd. 2
4.	Hydrocarbon	mg/L	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	GC/GCMS
5.	Lead as Pb	mg/L	0.064	0.072	0.044	0.034	0.042	IS 3025 (PART 47) 1994
6.	Arsenic as As	mg/L	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	APHA 23 rd Ed.,2017,3114-C
7.	Nickel as Ni	mg/L	0.114	0.101	0.09	0.069	0.105	IS 3025 (PART 54) 2003
8.	Total Chromium as Cr	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	IS 3025 (PART 52) 2003
9.	Cadmium as Cd	mg/L	BDL(MDL:0.003)	BDL(MDL:0.003)	BDL(MDL:0.003)	BDL(MDL:0.003)	BDL(MDL:0.003)	IS 3025(PART 41) 1992
10.	Mercury as Hg	mg/L	BDL(MDL:0.001)	BDL(MDL:0.001)	BDL(MDL:0.001)	BDL(MDL:0.001)	BDL(MDL:0.001)	APHA 23 rd Ed.,2017, 3112-B
11.	Zinc as Zn	mg/L	0.132	0.246	0.129	0.122	0.197	IS 3025(PART 49) 1994
12.	Copper as Cu	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	IS 3025 (PART 42) 1992
13.	Iron as Fe	mg/L	0.12	0.85	0.79	1.12	0.94	IS 3025(PART 53) 2003
14.	Insecticides/Pesticides	µg/L	Absent	Absent	Absent	Absent	Absent	USEPA 8081 B
15.	Depth of Water Level from Ground Level	meter	1.9	2.1	1.95	2.15	2	--



Mr. Nilesh Patel
Sr. Chemist

Mr. Nitin Tandel
Technical Manager

Minimum Detection Limit

Ambient Air Quality Monitoring

Sr. No.	Test Parameter	Unit	MDL
1	Particulate Matter (PM10)	µg/m ³	5 µg/m ³
2	Particulate Matter (PM2.5)	µg/m ³	5 µg/m ³
3	Sulphur Dioxide (SO ₂)	µg/m ³	4 µg/m ³
4	Nitrogen Dioxide (NO ₂)	µg/m ³	5 µg/m ³
5	Carbon Monoxide (CO)	mg/m ³	0.01 mg/m ³
6	Ammonia (NH ₃)	µg/m ³	5 µg/m ³
7	Ozone (O ₃)	µg/m ³	5 µg/m ³
8	Lead (Pb)	µg/m ³	0.5 µg/m ³
9	Nickle (Ni)	ng/m ³	1 ng/m ³
10	Arsenic (As)	ng/m ³	1 ng/m ³
11	Benzene	µg/m ³	1µg/m ³
12	Benzo(o)Pyrene	ng/m ³	0.1 ng/m ³
14	Hydro Carbon	µg/m ³	1 µg/m ³

Stack Emission Monitoring

Sr. No.	Test Parameter	Unit	MDL
1	Suspended particulate matter	mg/Nm ³	2 mg/Nm ³
2	Sulphur Dioxide SO ₂	mg/Nm ³	4 mg/Nm ³
3	Oxides of Nitrogen NO _x	mg/Nm ³	5 mg/Nm ³

ETP Water			
Sr. No.	Test Parameter	Unit	MDL
1	Colour	Pt. Co. Scale	5
2	pH @ 27 ° C	--	2
3	Temperature	OC	5
4	Total Suspended Solids	mg/L	4
5	Total Dissolved Solids	mg/L	4
6	COD	mg/L	2
7	BOD (3 days at 27 OC)	mg/L	1
8	Chloride (as Cl) -	mg/L	1
9	Oil & Grease	mg/L	2
10	Sulphate (as SO ₄)	mg/L	1
11	Ammonical Nitrogen	mg/L	2
12	Phenolic Compound	mg/L	0.1
13	Copper as Cu	mg/L	0.05
14	Lead as Pb	mg/L	0.01
15	Sulphide as S	mg/L	0.05
16	Cadmium as Cd	mg/L	0.003
17	Fluoride as F	mg/L	0.2
18	Residual Chlorine	mg/L	0.1
19	Percent Sodium	%	--
20	Sodium Absorption ratio	--	--

MARINE WATER			
Sr. No.	Test Parameter	Unit	MDL
1	pH	--	5
2	Temperature	oC	5
3	Total Suspended Solids	mg/L	4
4	BOD (3 Days @ 27oC)	mg/L	1
5	Dissolved Oxygen	mg/L	0.2
6	Salinity	ppt	0.01
7	Oil & Grease	mg/L	2
8	Nitrate as NO ₃	μmol/L	0.4
9	Nitrite as NO ₂	μmol/L	0.04
10	Ammonical Nitrogen as NH ₃	μmol/L	0.8
11	Phosphates as PO ₄	μmol/L	0.4
12	Total Nitrogen	μmol/L	2.2
13	Petroleum Hydrocarbon	μg/L	0.1
14	Total Dissolved Solids	mg/L	4
15	COD	mg/L	2

Sea SEDIMENT			
Sr. No.	Test Parameter	Unit	MDL
1	Organic Matter	%	0.5
2	Phosphorus as P	µg/g	1
3	Texture	--	--
4	Petroleum Hydrocarbon	µg/g	0.1
5	Aluminum as Al	%	0.1
6	Total Chromium as Cr+3	µg/g	2
7	Manganese as Mn	µg/g	1
8	Iron as Fe	%	0.1
9	Nickel as Ni	µg/g	1
10	Copper as Cu	µg/g	1
11	Zinc as Zn	µg/g	1
12	Lead as Pb	µg/g	1
13	Mercury as Hg	µg/g	0.05

BORE HOLE WATER			
Sr. No.	Test Parameter	Unit	MDL
1	pH @ 25 ° C	--	5
2	Salinity	ppt	--
3	Oil & Grease	mg/L	2
4	Hydrocarbon	mg/L	0.1
5	Lead as Pb	mg/L	0.01
6	Arsenic as As	mg/L	0.01
7	Nickel as Ni	mg/L	0.02
8	Total Chromium as Cr	mg/L	0.05
9	Cadmium as Cd	mg/L	0.003
10	Mercury as Hg	mg/L	0.001
11	Zinc as Zn	mg/L	0.05
12	Copper as Cu	mg/L	0.05
13	Iron as Fe	mg/L	0.1
14	Insecticides/Pesticides	µg/L	0.1
15	Depth of Water Level from Ground Level	meter	--

Annexure – 4

ADANI PORTS AND SPECIAL ECONOMIC ZONE LTD.
MUNDRA
OIL SPILL CONTINGENCY RESPONSE PLAN

ANNEXURES

ANNEXURE 1			INITIAL OIL SPILL REPORT
Particulars of person, office reporting	Capt. Sachin Srivastava- HOD Marine Capt. Rajat Garg - HOS marine, APSEZ		
Tel No.	+91 6359883102		
Date & time of incident	30.11.2022 / 1052 hrs		
Spill location	IOCL SPM		
Likely cause of spill	Leakage from SPM Hose joining flange	Witness – Tug Victor	
Initial response action	Initiated OSCRP		
Any other information	NO		
Identity of informant	Tug Victor		
Time of FIR	1112		
Source of spill	IOCL SPM floating hose		
Cause of spill	Leakage from flange		
Type of spill	Crude Oil		
Color code information (from CG)	Yellow		
Radius of slick	10-12 m		
Tail	15 m		
Volume	0.5 to 0.7 cubic meter approx.		
Quantity	20 to 25 L		
Weather	NE' Ly x 6-8 knots.		
Tide / current	Ebbing / 0.1 to 0.2 knots.		
Density	0.2 to 0.86 kg/m cube approx.		
Layer thickness	0.02 mm approx.		
Air / Sea temp.	24 deg C / 22 deg C		
Predicted slick movement	SW'ly		
Size of spill classification (Tier 1, 2 or 3)	Tier 1		

ADANI PORTS AND SPECIAL ECONOMIC ZONE LTD.
MUNDRA
OIL SPILL CONTINGENCY RESPONSE PLAN

ANNEXURE 2

POLREP

In case of an oil spill, MPSEZ will provide information to Commandant Coast Guard District 1 Porbandar COMDIS 1 and Coast Guard Station Vadinar CGS Vadinar in the following format:

SN.	Parameter	Data
1.	Identity of the informant	Tug Victor
2.	Time of information receipt	1112
3.	Source of Spill	IOCL SPM
4.	Cause of Spill	Hose rupture while discharging Cargo
5.	Type of oil	Crude Oil
6.	Colour code information	Yellow
7.	Configuration	-
8.	Radius	10 to 12 m
9.	Tail	15 m
10.	Volume	0.5 to 0.7 cubic meter approx.
11.	Quantity	20 to 25 L
12.	Weathered or Fresh	Fresh
13.	Density	0.2 to 0.86 kg/m cube approx.
14.	Viscosity	-2-4.5 CST@40 deg centigrade
15.	Wind	NE' Ly x 6 - 8 knots.
16.	Wave Height	0.1 to 0.2 m
17.	Current	0.1 to 0.2 knots.
18.	Layer Thickness	0.2 to 0.4 mm approx.
19.	Ambient air temperature	25 deg C
20.	Ambient sea temperature	23 deg C
21.	Predicted slick movement	SW'ly
22.	Confirm Classification of spill size	Tier 1

Log Sheet of Drill

Page Number: 1 of 1	Date: 30-11-2022
Name: Anish	Position: Radio Officer
Contact Number: 9825228673	Signature:

Activity Timeline:

1052- Dol 11 informed on VHF that Tug Victor reported oil spillage from SPM hose.

1052- Informed Dol 11 to report same to SPM & Diving In charge onboard.

1052 – Dolphin 11 commenced lowering Containment Boom

1053- Informed HOD Marine / HOD-Marine Technical/ HOS

1054- Informed POC & Tech team (Mr. Jimish).

1054- Dol 11 sent Zodiac to the site for inspection.

1055- Dol 11 reported lowering boom.

1055- Tide Ebbing (HW- 0645- 5.68. LW-1328-2.08), Wind NEly 6-8 kts

1055- Instruct Dol 2 & 15 at WB to prepare OSD boom and stand by to cast off.
(OSD ROB- Dol 2- 4.77 KL, Dol 15- 4.25 KL)

1056- Zodiac reported that inspected carried out and found leakage from floating hose. They have tighten the flange to reduce to leakage.

1056- Informed security/safety/medical/dredging by POC.

1057- Dol 11 reported valve tighten, leakage reduced.

1058- 50 meter boom paid out and continue.

1059- Informed Environment Dept & CG Station

1100- Dolphin 11 reported both side OSD spraying system started.

1100- ICG Mundra informed.

1110- Zodiac reported that the leakage is stopped from source

1101- Dol 11 reported leakage stopped.

1109- Dol 11 reported boom lowered 100 m and continue lowering.

1110- Informed Corporate/Legal/Commercial by POC.

1115- Dol 11 reported boom lowered 150 m and will lower 50 m more.

1122- Dol 11 reported boom lowered 200 m.

1131- Dol 11 reported U formation started.

1141- Dol 11 reported U formation completed will commence oil recovery soon.

1146- Dol 11 reported skimmer lowered in water and oil recovery commenced.

1159- Dol 11 reported oil recovery completed, skimmer recovered on deck and commencing boom recovery.

1245- Dol 11 reported boom recovered.

1245- Debrief carried out and Drill called off.

1247- Informed all concern.

Personnel & Boats Participated in Drill

Off Shore

- 01 Capt Girish Chandra
- 02 Mr. Yogesh Nandaniya
- 03 Mr. Sudhakar Singh
- 03 Mr. Ramdas Pawale
- 04 Mr. Yugul Kishor Sharma
- 05 Mr Leelu Singh Solanki
- 06 Mr Pradeep Pandey
- 07 Mr. Upinder Samkaria
- 08 Mr. Shashikant Padave
- 09 Mr. Santosh Rasam
- 10 Mr. Vishwanath Chauhan
- 11 Mr. Dharamveer Yadav
- 12 Mr Narayan –Tanker Seaman
- 13 Mr Bharmal Bishoni-Diver
- 14 Mr. Ayush – HMEI
- 15 04 members from Sea Care
- 16 Crew of Tug Dolphin 11
- 17 Crew of Tug Victor
- 18 Crew of Boat Al Dariyah
- 19 Tug Dol 2, 15

Onshore:

1. Capt Sachin Srivastava
2. Capt Rajat Garg
3. Mr. Anish
4. Mr Saket Kumar
5. Mr Salim Sayyad

Drill Performance Monitoring:

Sl. No	Activity	Time Taken
1.	Time taken to shift OSR equipment from SPM Store to load on DSV tugs	NA. 200 meter Fence boom and 1-skimmer is kept 24 x 7 on Tug Dol 11.
2.	Time taken for Tug cast off from time information given.	02 min.
3.	Time taken from tug cast off to Reach at Location.	05 min.
4.	Time taken for deploying 200 meter boom and skimmer after reaching at site.	30 min.
5	Time taken for J/U formation and deployment of skimmer.	19 min.




Observations:

SR. NO.	POINTS	ACTION TAKEN	TARGET DATE	RESPONSIBILITY	REMARKS
1	The communication flow between onsite, jetty and Control Room was clear and satisfactory.	NA	NA	NA	

Drill snap

<p>Pre Drill Briefing</p> 	<p>Boom laying from Dol 11</p> 
<p>U foramtion making in progress</p> 	<p>OSD Spraying System check from Dol 11</p> 
<p>Skimmer Operations</p> 	<p>U foramtion making in progress</p> 
<p>OSR Team on Tug Dolphin -11</p> 	

Annexure – 5

	ADANI PORTS AND SPECIAL ECONOMIC ZONE LIMITED																
	PIPE - TO - SOIL MONITORING REPORT																
MAINTENANCE BASE : MUNDRA PIPELINE SECTION : 48" X 6.2 KM SPM-IOCL CRUDE OIL PIPELINE AT ADANI PORTS, MUNDRA CP STATION LOCATION : TP2 CP SYSTEM PARAMETERS : DC Voltage = 4.40 VOLTS; DC Current = 4.2 AMP															DATE : 31.01.2023 REPORT NO : JANUARY23/09 DATE OF MONITORING : 31.01.2023		
TLP NO.	Type	Chainage KM	ON PSP (-volt)	OFF PSP (-volt)	AC VOLTAGE	Casing (-V w.r.t CSE)				Polarization coupon (-V w.r.t CSE)		HT Crossing		Foreign pipeline PSP (V w.r.t CSE)	Isolating Joint (-V w.r.t CSE)		Remarks
						Carrier PSP	Casing PSP	Casing Anode Potential (-V)	Casing Anode Current (mA)	ON PSP	OFF PSP	ZN Anode Potential (-V)	ZN Anode Resistance		Protected side PSP	Unprotected side PSP	
1	E	0.000	1.485	-	0.031	-	-	-	-	-	-	-	-	-	1.485	1.072	
2	D	0.425	1.470	-	0.039	0.862	0.862	NA	NA	-	-	-	-	-	-	-	
3	A	1.400	1.490	-	0.025	-	-	-	-	-	-	-	-	-	-	-	
4	A	2.400	1.480	-	0.017	-	-	-	-	-	-	-	-	-	-	-	
5	A	3.000	1.481	-	0.002	-	-	-	-	-	-	-	-	-	-	-	
6	D	3.440	1.467	-	0.003	0.684	0.684	NA	NA	-	-	-	-	-	-	-	
7	A	4.300	1.428	-	0.008	-	-	-	-	-	-	-	-	-	-	-	
8	A	5.200	1.415	-	0.012	-	-	-	-	-	-	-	-	-	-	-	
9	A	5.900	1.403	-	0.008	-	-	-	-	-	-	-	-	-	-	-	
10	E	6.200	1.387	-	0.022	-	-	-	-	-	-	-	-	-	1.387	0.962	
Remarks:																	
Monitored by : SAP ENPROCON PVT LTD Signature: Name : Harsh Vardhan Singh Designation : CP Engineer										<div style="text-align: center;">  </div> Reviewed by : Signature Name : Disignation :							

Graphical Representation of ON Mesured PSP

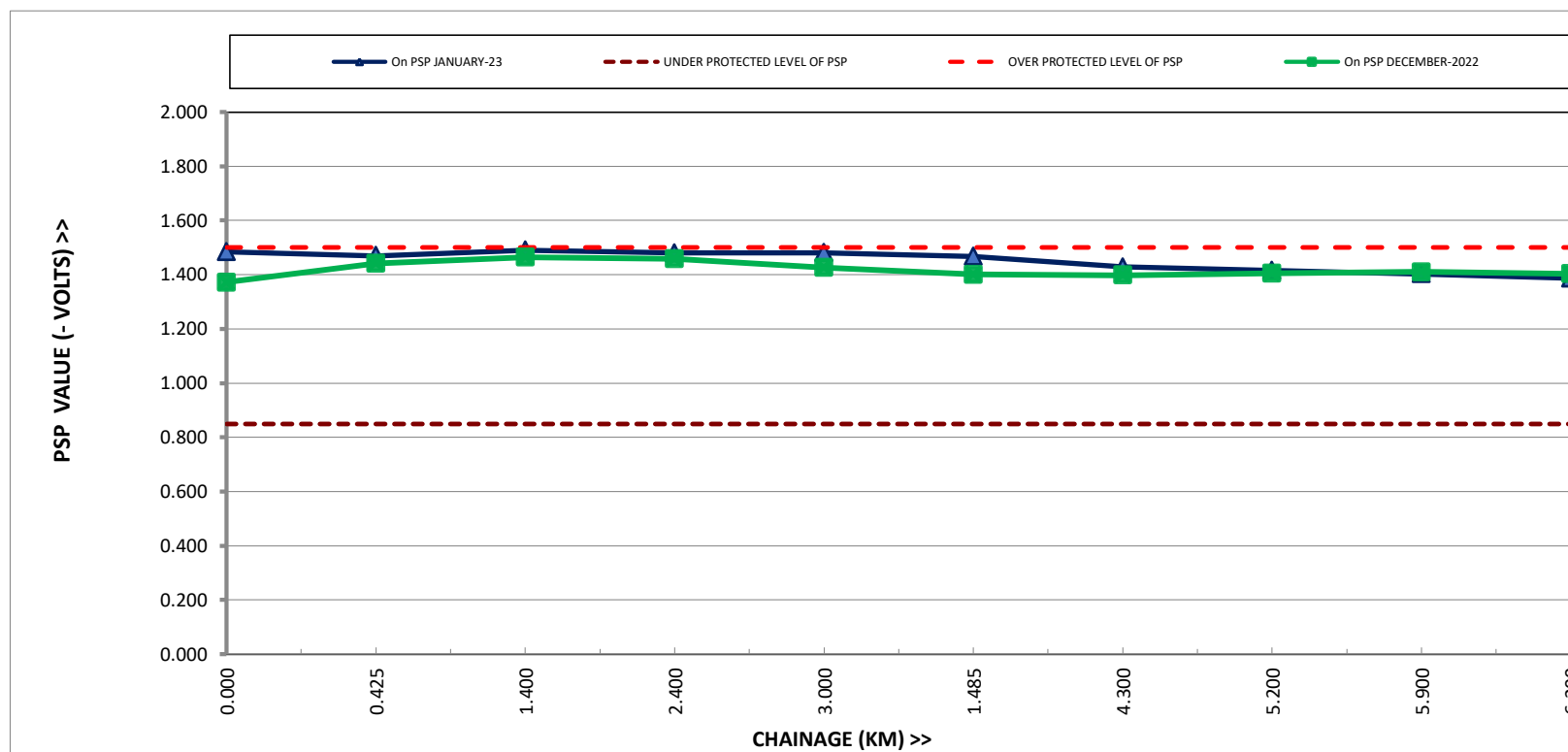
MAINTENANCE BASE : MUNDRA

PIPELINE SECTION : 48" X 6.2 KM SPM-IOCL CRUDE OIL PIPELINE AT ADANI PORTS, MUNDRA

CP STATION LOCATION : TP2

CP SYSTEM PARAMETERS : DC Voltage (V) = 4.40 DC Current (A) = 4.20

CP CONTRACTOR: SAP ENPROCON PVT LTD





LEGENDS

JANUARY 2023 ON PSP (VOLT)	(Blue Solid)
DECEMBER 2022 ON PSP (VOLT)	(Green Solid)
UNDER PROTECTED LEVEL OF PSP	(Brown Broken)
OVER PROTECTED LEVEL OF PSP	(Red Dashed)

Note : PSP value measured wrt Cu-CuSO4 portable reference Cell.



	ADANI PORTS AND SPECIAL ECONOMIC ZONE LIMITED PIPE - TO - SOIL MONITORING REPORT	
MAINTENANCE BASE : MUNDRA PIPELINE SECTION : 48" X 6.2 KM SPM-IOCL CRUDE OIL PIPELINE AT ADANI PORTS, MUNDRA CP STATION LOCATION : TP2 CP SYSTEM PARAMETERS : DC Voltage = 5.20 VOLTS; DC Current = 4.0 AMP		DATE : 28.02.2023 REPORT NO : FEBRUARY23/10 DATE OF MONITORING : 28.02.2023

TLP NO.	Type	Chainage KM	ON PSP (-volt)	OFF PSP (-volt)	AC VOLTAGE	Casing (-V w.r.t CSE)				Polarization coupon (-V w.r.t CSE)		HT Crossing		Foreign pipeline PSP (-V w.r.t CSE)	Isolating Joint (-V w.r.t CSE)		Remarks
						Carrier PSP	Casing PSP	Casing Anode Potential (-V)	Casing Anode Current (mA)	ON PSP	OFF PSP	ZN Anode Potential (-V)	ZN Anode Resistance		Protected side PSP	Unprotected side PSP	
1	E	0.000	1.361	-	0.040	-	-	-	-	-	-	-	-	-	1.361	1.038	
2	D	0.425	1.491	-	0.035	1.491	0.843	NA	NA	-	-	-	-	-	-	-	
3	A	1.400	1.434	-	0.030	-	-	-	-	-	-	-	-	-	-	-	
4	A	2.400	1.479	-	0.025	-	-	-	-	-	-	-	-	-	-	-	
5	A	3.000	1.451	-	0.010	-	-	-	-	-	-	-	-	-	-	-	
6	D	3.440	1.424	-	0.010	1.424	0.535	NA	NA	-	-	-	-	-	-	-	
7	A	4.300	1.367	-	0.005	-	-	-	-	-	-	-	-	-	-	-	
8	A	5.200	1.390	-	0.024	-	-	-	-	-	-	-	-	-	-	-	
9	A	5.900	1.436	-	0.061	-	-	-	-	-	-	-	-	-	-	-	
10	E	6.200	1.432	-	0.091	-	-	-	-	-	-	-	-	-	1.432	0.961	

Remarks:

Monitored by : SAP ENPROCON PVT LTD Signature: Name : Harsh Vardhan Singh Designation : CP Engineer	Reviewed by : Signature Name : Disignation :
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Graphical Representation of ON Mesured PSP

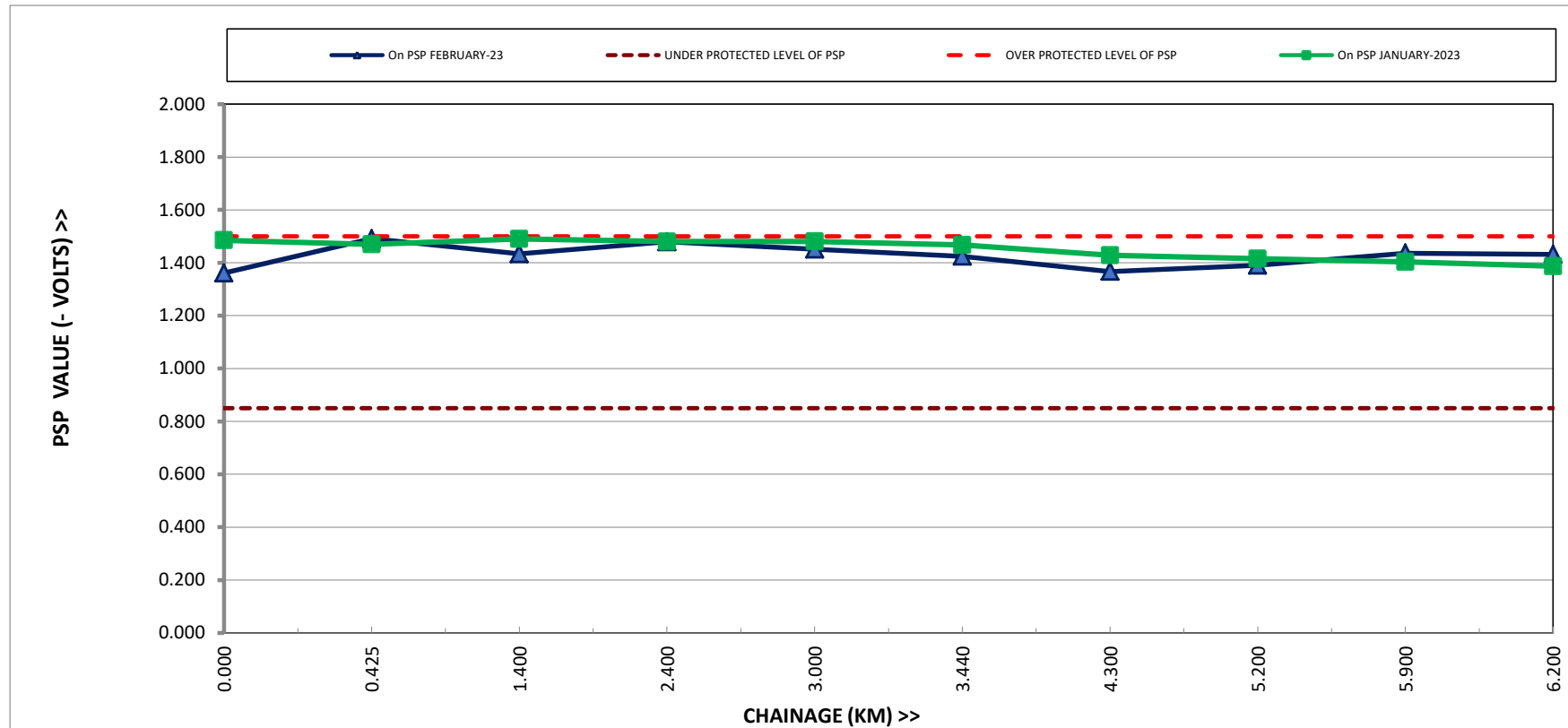
MAINTENANCE BASE : MUNDRA

PIPELINE SECTION : 48" X 6.2 KM SPM-IOCL CRUDE OIL PIPELINE AT ADANI PORTS, MUNDRA

CP STATION LOCATION : TP2

CP SYSTEM PARAMETERS : DC Voltage (V) = 5.20 DC Current (A) = 4.00

CP CONTRACTOR: SAP ENPROCON PVT LTD





LEGENDS

FEBRUARY 2023 ON PSP (VOLT)	(Blue Solid)
JANUARY 2023 ON PSP (VOLT)	(Green Solid)
UNDER PROTECTED LEVEL OF PSP	(Brown Broken)
OVER PROTECTED LEVEL OF PSP	(Red Dashed)

Note : PSP value measured wrt Cu-CuSO4 portable reference Cell.



	ADANI PORTS AND SPECIAL ECONOMIC ZONE LIMITED																
	PIPE - TO - SOIL MONITORING REPORT																
MAINTENANCE BASE : MUNDRA PIPELINE SECTION : 48" X 6.2 KM SPM-IOCL CRUDE OIL PIPELINE AT ADANI PORTS, MUNDRA CP STATION LOCATION : TP2 CP SYSTEM PARAMETERS : DC Voltage = 4.8 VOLTS; DC Current = 3.8 AMP															DATE : 24.03.2023 REPORT NO : MARCH23/11 DATE OF MONITORING : 24.03.2023		
TLP NO.	Type	Chainage KM	ON PSP (-volt)	OFF PSP (-volt)	AC VOLTAGE	Casing (-V w.r.t CSE)				Polarization coupon (-V w.r.t CSE)		HT Crossing		Foreign pipeline PSP (V w.r.t CSE)	Isolating Joint (-V w.r.t CSE)		Remarks
						Carrier PSP	Casing PSP	Casing Anode Potential (-V)	Casing Anode Current (mA)	ON PSP	OFF PSP	ZN Anode Potential (-V)	ZN Anode Resistance		Protected side PSP	Unprotected side PSP	
1	E	0.000	1.415	-	0.028	-	-	-	-	-	-	-	-	-	1.415	1.071	
2	D	0.425	1.476	-	0.029	1.476	0.815	NA	NA	-	-	-	-	-	-	-	
3	A	1.400	1.456	-	0.025	-	-	-	-	-	-	-	-	-	-	-	
4	A	2.400	1.477	-	0.018	-	-	-	-	-	-	-	-	-	-	-	
5	A	3.000	1.441	-	0.002	-	-	-	-	-	-	-	-	-	-	-	
6	D	3.440	1.410	-	0.007	1.410	0.529	NA	NA	-	-	-	-	-	-	-	
7	A	4.300	1.403	-	0.003	-	-	-	-	-	-	-	-	-	-	-	
8	A	5.200	1.412	-	0.008	-	-	-	-	-	-	-	-	-	-	-	
9	A	5.900	1.431	-	0.009	-	-	-	-	-	-	-	-	-	-	-	
10	E	6.200	1.436	-	0.011	-	-	-	-	-	-	-	-	-	1.436	1.032	
Remarks:																	
Monitored by : SAP ENPROCON PVT LTD Signature: Name : Harsh Vardhan Singh Designation : CP Engineer										Reviewed by : Signature Name : Disignation :							



Graphical Representation of ON Mesured PSP

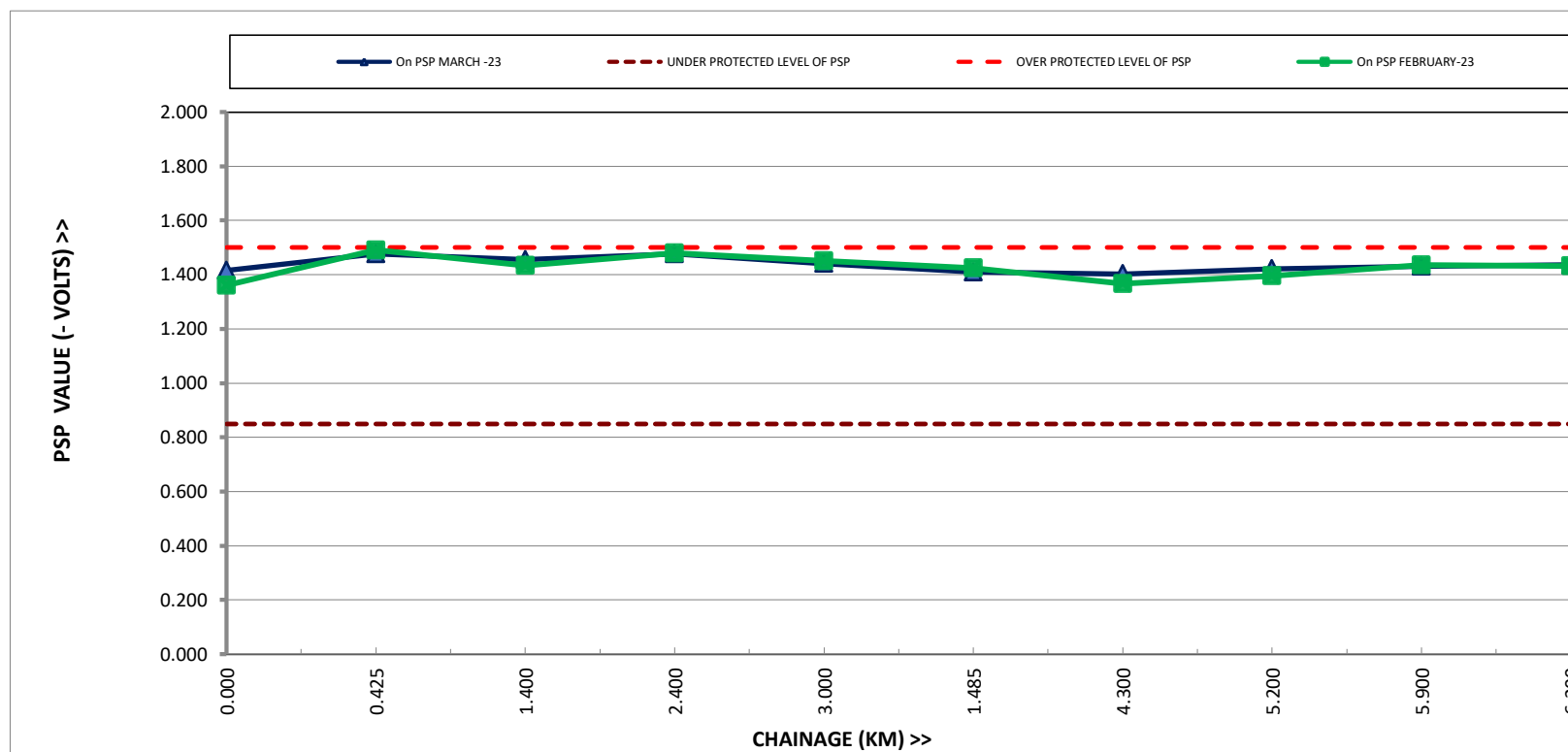
MAINTENANCE BASE : MUNDRA

PIPELINE SECTION : 48" X 6.2 KM SPM-IOCL CRUDE OIL PIPELINE AT ADANI PORTS, MUNDRA

CP STATION LOCATION : TP2

CP SYSTEM PARAMETERS : DC Voltage (V) = 4.50 DC Current (A) = 3.80

CP CONTRACTOR: SAP ENPROCON PVT LTD





LEGENDS

MARCH 2023 ON PSP (VOLT)	(Blue Solid)
FEBRUARY 2023 ON PSP (VOLT)	(Green Solid)
UNDER PROTECTED LEVEL OF PSP	(Brown Broken)
OVER PROTECTED LEVEL OF PSP	(Red Dashed)

Note : PSP value measured wrt Cu-CuSO4 portable reference Cell.



	ADANI PORTS AND SPECIAL ECONOMIC ZONE LIMITED																
	PIPE - TO - SOIL MONITORING REPORT																
MAINTENANCE BASE : MUNDRA PIPELINE SECTION : 48" X 6.2 KM SPM-IOCL CRUDE OIL PIPELINE AT ADANI PORTS, MUNDRA CP STATION LOCATION : TP2 CP SYSTEM PARAMETERS : DC Voltage = 4.500 VOLTS; DC Current = 3.6 AMPERE															DATE : 31.10.2022 REPORT NO : OCT22/06 DATE OF MONITORING : 31.10.2022		
TLP NO.	Type	Chainage KM	ON PSP (-volt)	OFF PSP (-volt)	AC VOLTAGE	Casing (-V w.r.t CSE)				Polarization coupon (-V w.r.t CSE)		HT Crossing		Foreign pipeline PSP (V w.r.t CSE)	Isolating Joint (-V w.r.t CSE)		Remarks
						Carrier PSP	Casing PSP	Casing Anode Potential (-V)	Casing Anode Current (mA)	ON PSP	OFF PSP	ZN Anode Potential (-V)	ZN Anode Resistance		Protected side PSP	Unprotected side PSP	
1	E	0.000	1.415	-	0.023	-	-	-	-	-	-	-	-	-	1.415	1.115	
2	D	0.425	1.382	-	0.084	1.382	0.775	NA	NA	-	-	-	-	-	-	-	
3	A	1.400	1.417	-	0.019	-	-	-	-	-	-	-	-	-	-	-	
4	A	2.400	1.416	-	0.015	-	-	-	-	-	-	-	-	-	-	-	
5	A	3.000	1.389	-	0.009	-	-	-	-	-	-	-	-	-	-	-	
6	D	3.440	1.356	-	0.004	1.356	0.526	NA	NA	-	-	-	-	-	-	-	
7	A	4.300	1.347	-	0.004	-	-	-	-	-	-	-	-	-	-	-	
8	A	5.200	1.351	-	0.009	-	-	-	-	-	-	-	-	-	-	-	
9	A	5.900	1.382	-	0.007	-	-	-	-	-	-	-	-	-	-	-	
10	E	6.200	1.359	-	0.003	-	-	-	-	-	-	-	-	-	1.359	1.082	
Remarks:																	
Monitored by : SAP ENPROCON PVT LTD Signature: Name : Harsh Vardhan Singh Designation : CP Engineer										Reviewed by : Signature Name : Disignation :							



Graphical Representation of ON Mesured PSP

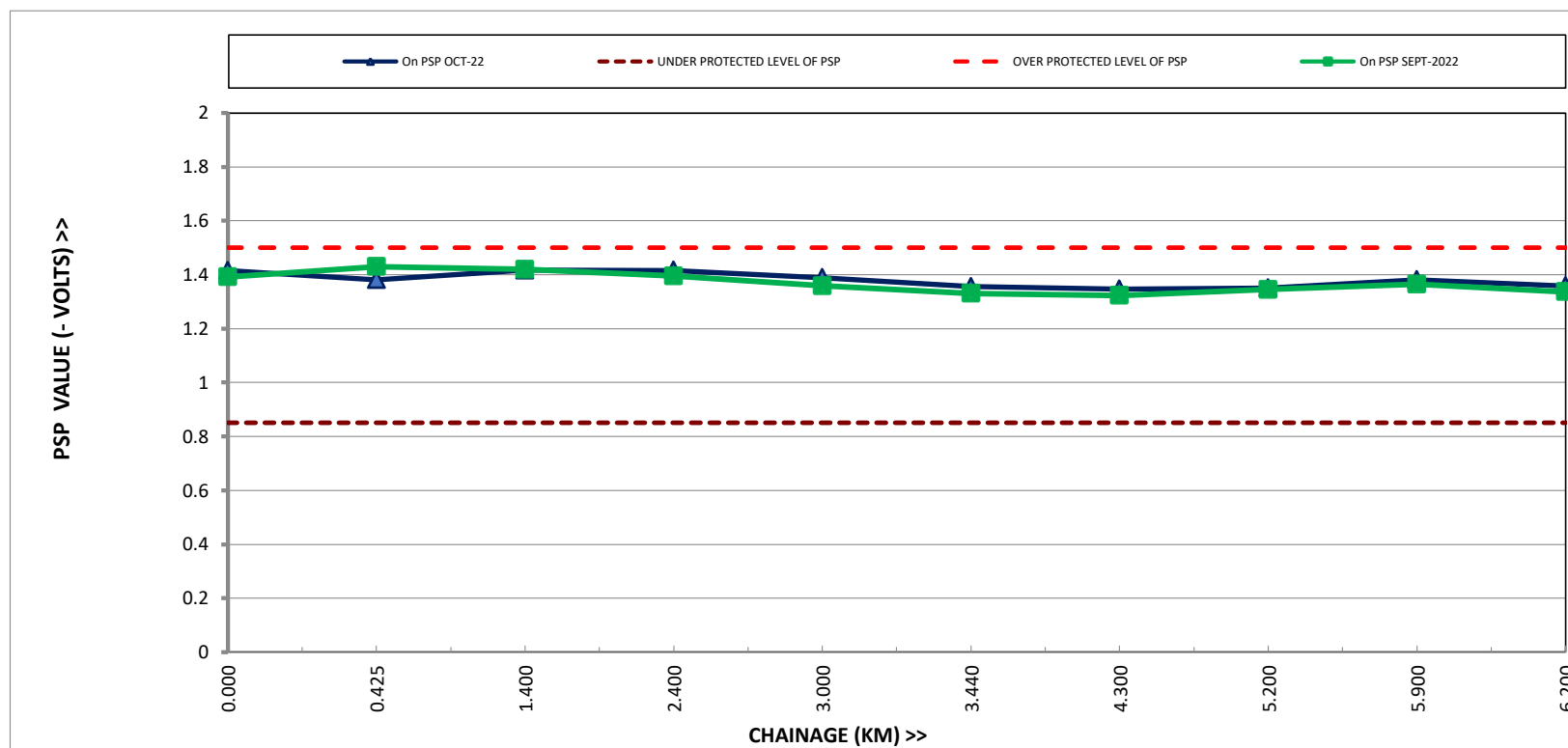
MAINTENANCE BASE : MUNDRA

PIPELINE SECTION : 48" X 6.2 KM SPM-IOCL CRUDE OIL PIPELINE AT ADANI PORTS, MUNDRA

CP STATION LOCATION : TP2

CP SYSTEM PARAMETERS : DC Voltage (V) = 4.5 DC Current (A) = 3.6

CP CONTRACTOR: SAP ENPROCON PVT LTD





LEGENDS

OCT-2022 ON PSP (VOLT)	(Blue Solid)
SEPT-2022 ON PSP (VOLT)	(Green Solid)
UNDER PROTECTED LEVEL OF PSP	(Brown Broken)
OVER PROTECTED LEVEL OF PSP	(Red Dashed)

Note : PSP value measured wrt Cu-CuSO4 portable reference Cell.



	ADANI PORTS AND SPECIAL ECONOMIC ZONE LIMITED														
	PIPE - TO - SOIL MONITORING REPORT														

MAINTENANCE BASE : MUNDRA

PIPELINE SECTION : 48" X 6.2 KM SPM-IOCL CRUDE OIL PIPELINE AT ADANI PORTS, MUNDRA

CP STATION LOCATION : TP2

CP SYSTEM PARAMETERS : DC Voltage = 4.80 VOLTS; DC Current = 4.0 AMP

DATE : 30.11.2022

REPORT NO : NOVEMBER22/07

DATE OF MONITORING : 30.11.2022

TLP NO.	Type	Chainage KM	ON PSP (-volt)	OFF PSP (-volt)	AC VOLTAGE	Casing (-V w.r.t CSE)				Polarization coupon (-V w.r.t CSE)		HT Crossing		Foreign pipeline PSP (-V w.r.t CSE)	Isolating Joint (-V w.r.t CSE)		Remarks
						Carrier PSP	Casing PSP	Casing Anode Potential (-V)	Casing Anode Current (mA)	ON PSP	OFF PSP	ZN Anode Potential (-V)	ZN Anode Resistance		Protected side PSP	Unprotected side PSP	
1	E	0.000	1.372	-	0.023	-	-	-	-	-	-	-	-	-	1.372	1.053	
2	D	0.425	1.441	-	0.046	0.793	0.793	NA	NA	-	-	-	-	-	-	-	
3	A	1.400	1.465	-	0.014	-	-	-	-	-	-	-	-	-	-	-	
4	A	2.400	1.459	-	0.016	-	-	-	-	-	-	-	-	-	-	-	
5	A	3.000	1.427	-	0.009	-	-	-	-	-	-	-	-	-	-	-	
6	D	3.440	1.401	-	0.005	0.529	0.529	NA	NA	-	-	-	-	-	-	-	
7	A	4.300	1.398	-	0.005	-	-	-	-	-	-	-	-	-	-	-	
8	A	5.200	1.405	-	0.010	-	-	-	-	-	-	-	-	-	-	-	
9	A	5.900	1.410	-	0.015	-	-	-	-	-	-	-	-	-	-	-	
10	E	6.200	1.403	-	0.018	-	-	-	-	-	-	-	-	-	1.403	1.018	


Remarks:

Monitored by : SAP ENPROCON PVT LTD

Signature:

Name : Harsh Vardhan Singh

Designation : CP Engineer



Reviewed by :

Signature

Name :

Disignation :

Graphical Representation of ON Mesured PSP

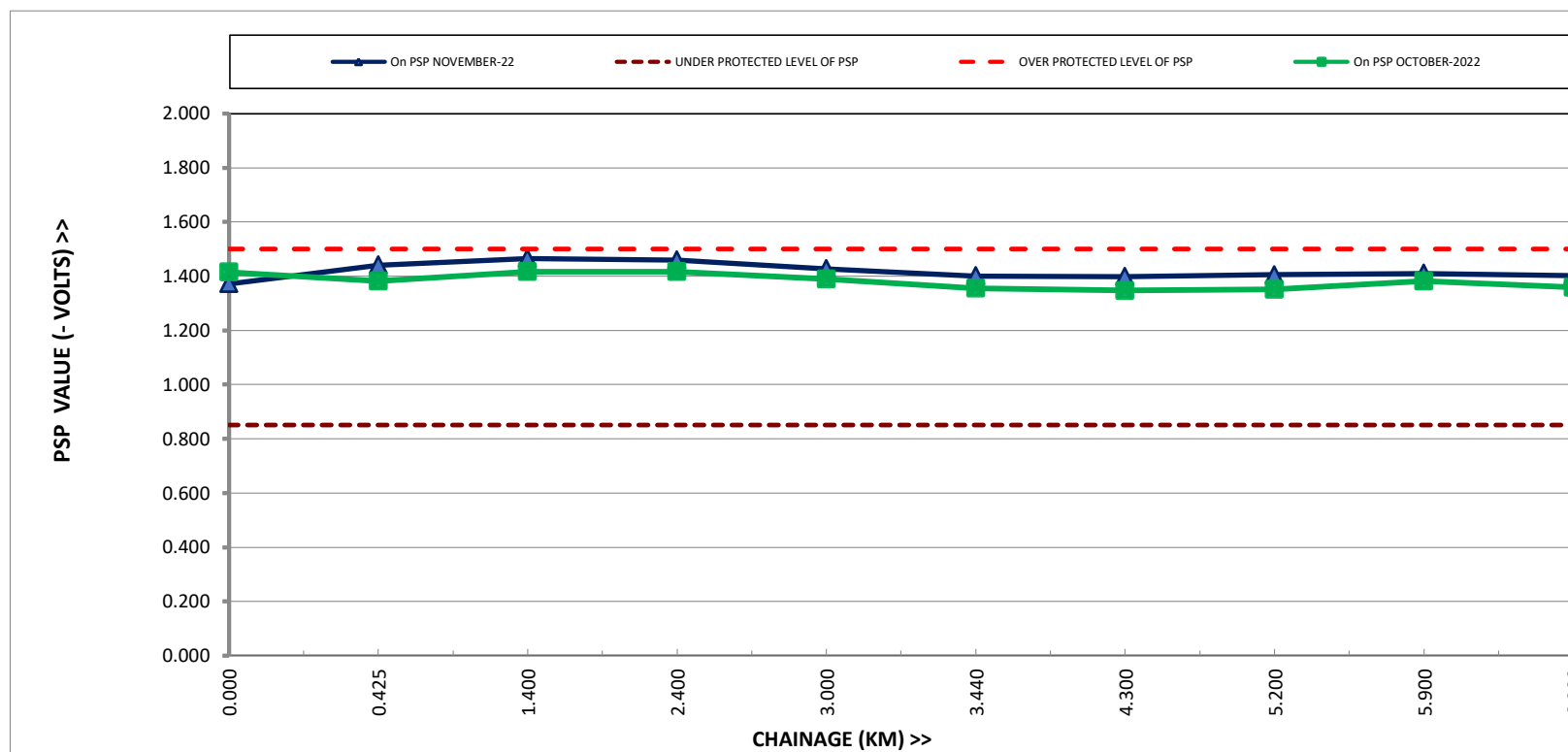
MAINTENANCE BASE : MUNDRA

PIPELINE SECTION : 48" X 6.2 KM SPM-IOCL CRUDE OIL PIPELINE AT ADANI PORTS, MUNDRA

CP STATION LOCATION : TP2

CP SYSTEM PARAMETERS : DC Voltage (V) = 4.80 DC Current (A) = 4.00

CP CONTRACTOR: SAP ENPROCON PVT LTD





LEGENDS

NOVEMBER-2022 ON PSP (VOLT)	(Blue Solid)
OCTOBER-2022 ON PSP (VOLT)	(Green Solid)
UNDER PROTECTED LEVEL OF PSP	(Brown Broken)
OVER PROTECTED LEVEL OF PSP	(Red Dashed)

Note : PSP value measured wrt Cu-CuSO4 portable reference Cell.



	ADANI PORTS AND SPECIAL ECONOMIC ZONE LIMITED																
	PIPE - TO - SOIL MONITORING REPORT																
MAINTENANCE BASE : MUNDRA PIPELINE SECTION : 48" X 6.2 KM SPM-IOCL CRUDE OIL PIPELINE AT ADANI PORTS, MUNDRA CP STATION LOCATION : TP2 CP SYSTEM PARAMETERS : DC Voltage = 5.00 VOLTS; DC Current = 4.2 AMP														DATE : 31.12.2022 REPORT NO : DECEMBER22/08 DATE OF MONITORING : 30.12.2022			
TLP NO.	Type	Chainage KM	ON PSP (-volt)	OFF PSP (-volt)	AC VOLTAGE	Casing (-V w.r.t CSE)				Polarization coupon (-V w.r.t CSE)		HT Crossing		Foreign pipeline PSP (V w.r.t CSE)	Isolating Joint (-V w.r.t CSE)		Remarks
						Carrier PSP	Casing PSP	Casing Anode Potential (-V)	Casing Anode Current (mA)	ON PSP	OFF PSP	ZN Anode Potential (-V)	ZN Anode Resistance		Protected side PSP	Unprotected side PSP	
1	E	0.000	1.442	-	0.028	-	-	-	-	-	-	-	-	-	1.442	1.086	
2	D	0.425	1.446	-	0.034	0.806	0.806	NA	NA	-	-	-	-	-	-	-	
3	A	1.400	1.421	-	0.024	-	-	-	-	-	-	-	-	-	-	-	
4	A	2.400	1.408	-	0.017	-	-	-	-	-	-	-	-	-	-	-	
5	A	3.000	1.445	-	0.003	-	-	-	-	-	-	-	-	-	-	-	
6	D	3.440	1.425	-	0.008	0.509	0.509	NA	NA	-	-	-	-	-	-	-	
7	A	4.300	1.421	-	0.005	-	-	-	-	-	-	-	-	-	-	-	
8	A	5.200	1.415	-	0.010	-	-	-	-	-	-	-	-	-	-	-	
9	A	5.900	1.432	-	0.012	-	-	-	-	-	-	-	-	-	-	-	
10	E	6.200	1.384	-	0.016	-	-	-	-	-	-	-	-	-	1.384	0.996	
Remarks:																	
Monitored by : SAP ENPROCON PVT LTD Signature: Name : Harsh Vardhan Singh Designation : CP Engineer										Reviewed by : Signature Name : Disignation :							



Graphical Representation of ON Mesured PSP

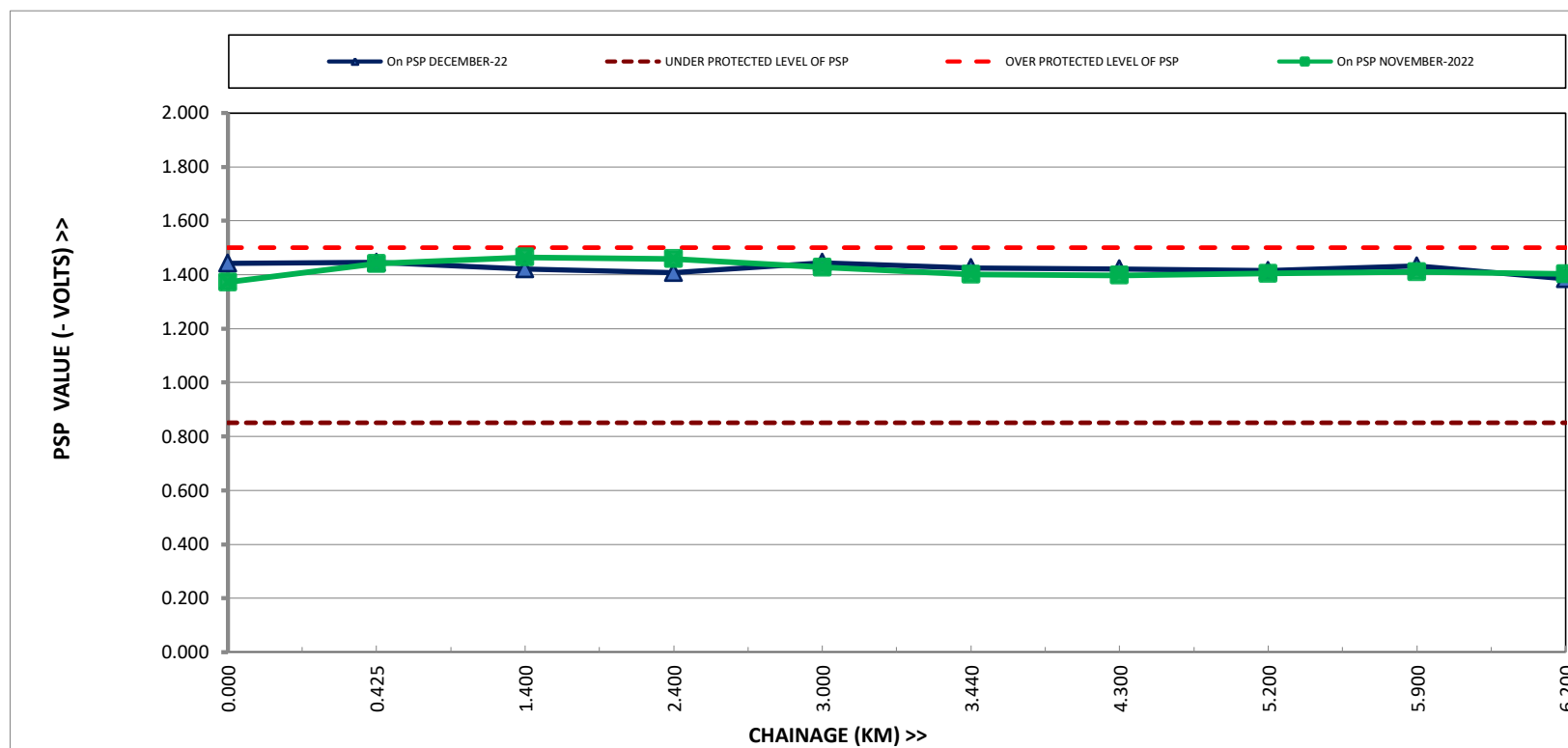
MAINTENANCE BASE : MUNDRA

PIPELINE SECTION : 48" X 6.2 KM SPM-IOCL CRUDE OIL PIPELINE AT ADANI PORTS, MUNDRA

CP STATION LOCATION : TP2

CP SYSTEM PARAMETERS : DC Voltage (V) = 5.00 DC Current (A) = 4.20

CP CONTRACTOR: SAP ENPROCON PVT LTD



LEGENDS

DECEMBER 2022 ON PSP (VOLT)	(Blue Solid)
NOVEMBER-2022 ON PSP (VOLT)	(Green Solid)
UNDER PROTECTED LEVEL OF PSP	(Brown Broken)
OVER PROTECTED LEVEL OF PSP	(Red Dashed)

Note : PSP value measured wrt Cu-CuSO4 portable reference Cell.



Annexure – 6

Cost of Environmental Protection Measures

Sr. No.	Activity	Cost incurred (INR in Lacs)			Budgeted Cost (INR in Lacs)
		2020 – 21	2021 – 22	2022 – 23	2022 – 23
1.	Environmental Study / Audit and Consultancy	6.2	6.82	7.32	11.05
2.	Legal & Statutory Expenses	10.58	10.52	12.32	12
3.	Environmental Monitoring Services	19.17	14.31	15.32	33
4.	Hazardous / Non-Hazardous Waste Management & Disposal	83.55	107.09	104.035	127.72
5.	Environment Days Celebration and Advertisement / Business development	5.3	4.04	2.53	8.00
6.	Treatment and Disposal of Bio-Medical Waste	2.09	2.14	2.29	2.04
7.	Mangrove Plantation, Monitoring & Conservation	32.59	53.6	50.0	50.0
8.	Other Horticulture Expenses	689	921	956	979
9.	O&M of Sewage Treatment Plant and Effluent Treatment Plant (including STP, ETP of Port & SEZ & Common Effluent Treatment Plant)	148.49	252.27	141.33	164.46
10.	Expenditure of Environment Dept. (Apart from above head)	89.11	149.8	90.136	75.79
Total		1086.08	1371.79	1381.28	1463.06

Annexure – 7

Compliance Report of CIA Study Environment Management Plan

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude ¹	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance
1	Land Use Change						
1.1	<p>It is predicted that the built up land in the rural areas would increase by an order 50% from the baseline 2015.</p> <p>New settlements near the SEZ area might create slums.</p> <p>Unorganized urban development leading to poor sanitation and proliferation</p>	Level - 1	<p>APSEZ has developed two townships (Shantivan and Samudra) presently accommodating 1668 households. Necessary permissions from concerned authorities were already obtained for the development of townships and Associated infrastructure facilities.</p>	<p>The existing townships will be expanded to accommodate about 4 lakh people when the APSEZ is fully developed.</p>	APSEZ	As and when Required	<p>APSEZ has developed two townships (Shantivan and Samudra) accommodating 2045 households and associated infrastructure facilities. Accommodation is made available for all interested employees working within Adani group & SEZ industries. Out of which 96.87% Occupancies are accommodated within the townships and rest are available for employees working within APSEZ.</p> <p>At present 71 nos. of industries (processing & non-processing) are present within the SEZ (54 nos. are in operation). Township facilities are also made by some of SEZ industries within Mundra town for their employees with basic infrastructure facilities and requirements.</p> <p>Most of the employees working in SEZ industries are residing in Mundra township having all basic requirements and associated facilities.</p> <p>The existing social infrastructure facilities are adequate for present development at APSEZ. The existing townships with associated facilities will be</p>

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance
	of vectors and disease.						<p>expanded as per requirement.</p> <p>APSEZ has also been granted permission for receiving domestic sewage @ 2.5 MLD from Mundra village (which was earlier discharged into open area within Mundra region) into wastewater treatment plant for treatment and disposal. APSEZ has already started receiving of domestic sewage from Mundra, which abates the poor sanitation and unhygienic condition within Mundra region. Total project cost for laying domestic sewage underground pipeline with other associated facilities from Mundra to APSEZ is 362 Lacs.</p>
1.2	Once the project is fully developed, due to increase in built up land in the APSEZ area, there will be an increase in the storm water runoff from the facility.	Level-1	The study area experiences scanty rainfall less than 400 mm/year. Considering the natural gradient, APSEZ have designed and implemented storm water	Technical feasibility study can be carried out to explore the possibility of developing storm water collection ponds to utilize maximum possible storm water runoff for dust suppression in the coal yard areas during non-rainy days.	APSEZ	Technical Study - one time, Implementation - Continual process	<p>Presently, ~ 51.7 % of the total SEZ is developed. Based on technical studies,</p> <p>At present all existing coal yards are designed with drain, for collection of water during water sprinkling and rainfall, which is carried away to dump pond. Supernatant water from dump pond is being collected and used for dust suppression activities or after sedimentation, discharged to sea. Details of drain and dump pond has been submitted in along with EC compliance report (Oct 19 to March 20). Analysis of said water discharging into sea during monsoon season is being carried out (twice in a year during monsoon) through NABL / MoEF&CC accredited laboratory. Analysis report of the same shows there is</p>

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance
			drains in the existing facility to meet the peak daily rainfall of 440 mm/hr. Hence flooding of water in the neighboring areas is not envisaged.				no any contamination. The report was submitted in the last compliance period Apr'22 to Sep'22. During compliance period FY 2022-23, total recorded rain fall was 1025 mm observed, which was much less than the design capacity of existing storm water drainage system. So our existing storm water management facility is adequate to handle the storm water runoff from the area. Hence flooding of water in the neighboring areas is not envisaged.
			As per the directions given in the environmental clearance issued for the proposed Multi-Product SEZ and CRZ clearance for Desalination, sea water intake, outfall	The channel depth in all the natural streams shall be maintained to accommodate peak flood flow during the monsoon and periodical de-silting activities in the natural streams passing through the APSEZ area	APSEZ, District Administration* and Irrigation department	As and When Required	Presently there is no Desalination plant, sea water intake and outfall facility developed as part of EC & CRZ clearance of Multiproduct SEZ. The project will be designed and implemented as per requirement without disturbing the natural flow of rainwater in all the seasonal streams.

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance
			facility and pipeline project, the master plan of the project was designed and being implemented without disturbing the natural flow of rainwater in all the seasonal streams.				
1. 3	Due to conservation and protection of mangroves in the designated conservation area, it has been predicted	Positive Impact with ecological benefits	In addition to conservation of the identified 1254 ha mangrove areas around Mundra port and SEZ, APSEZ has taken up large scale	APSEZ will continue mangrove afforestation as per the commitment made with concerned regulatory authority	APSEZ	Short Term	<p>APSEZ has carried out mangrove afforestation in 3890 ha. area across the coast of Gujarat till date. Total expenditure for the same till date is INR 1070.8 lakh.</p> <p>No further mangrove afforestation is pending w.r.t. commitment made with concerned regulatory authority for APSEZ, Mundra project.</p> <p>As per study conducted by NCSCM, Chennai in 2017, mangrove cover in and around APSEZ, Mundra has increased from 2094 Ha to 2340 ha (as compared between 2011 to 2017). The analysis has shown an</p>

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance			
	that the current mangrove footprint area would marginally increase in next 15 years due to natural growth. This will enhance the overall biodiversity in the local coastal ecosystem.		mangrove afforestation activities in an area of more than 2800 ha at various locations across the coast of Gujarat state in consultation with various organizations				<p>overall growth of 246 ha. The cost for said study was INR 3.15 Cr.</p> <p>Recently study was carried out in the year 2019 and based on that there is an increase of mangrove cover between March 2017 (Total 2340) and September 2019 with an extent of 256 Ha (Total 2596 Ha Area) which is about 10.94% rise in growth rate, also It reveals that the mangrove and the tidal system in the creeks remained undisturbed over this period.</p> <p>Hence, there is an overall growth of mangroves in creeks in and around APSEZ, Mundra is 502 Ha between 2011 and 2019.</p> <p>Analysis of data between categories indicated that there was an increase in dense mangroves along with the conversion of scattered into sparse, that shows the growth of mangroves in a progressive direction.</p> <p>As a part of GCZMA recommendations and NCSCM mangrove conservation action plan, APSEZ has undertaken following activities.</p> <table><tr><td>S r . N</td><td>Recommendations</td><td>Compliance</td></tr></table>	S r . N	Recommendations	Compliance
S r . N	Recommendations	Compliance								

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance		
							0		
							1	Mangrove mapping and monitoring in and around APSEZ	<ul style="list-style-type: none"> APSEZ entrusted NCSCM, Chennai to carry out Monitoring of mangrove distribution in creeks in and around APSEZ and shoreline changes in Bocha island. As a part of this study, overall growth of mangroves in the creeks in and around APSEZ was assessed comparing Google earth images of 2017 & 2019 and it is observed that there was increase in mangrove cover between March 2017 and September 2019 to the extent of 256 Ha, which is about 10.7%. This suggests that the mangroves and the tidal system in the creeks remain undisturbed over this period. Analysis of data between categories indicated that

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance		
									<p>there was an increase in dense mangroves and also conversion of scattered to sparse which also shows that the growth of mangroves in a progressive direction.</p> <ul style="list-style-type: none"> Hence, there is an overall growth of mangroves in creeks in and around APSEZ, Mundra is 502 Ha between 2011 and 2019. The cost of the said study was INR 23.56 Lacs incurred by APSEZ.
							2	Tidal observation in creeks in and around APSEZ	<ul style="list-style-type: none"> APSEZ carried out the tidal observations at locations similar to 2017 in Kotdi, Baradimata, Navinal, Bocha and Khari creeks under the guidance of NCSCM. The observed tidal ranges indicate that the creeks experience normal tidal ranges, adequate for the growth of mangroves.

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance		
									<ul style="list-style-type: none"> The cost of the said activity was INR 1.0 Lacs.
							3	Removal of Algal and Prosopis growth from mangrove areas	<ul style="list-style-type: none"> Algal and Prosopis growth monitoring was done in and around mangrove area and algal encrustation was found in some of the mangrove areas, which has been removed manually. The cost of the said activity was INR 2.35 Lacs during the FY 2022-23. The details of Removal of Algal and Prosopis growth from mangrove areas is attached as Annexure -8.
							4	Awareness of mangroves importance in surrounding communities	<ul style="list-style-type: none"> Adani Foundation – CSR Arm of Adani group has done awareness camps/activities created in the community regarding importance of mangroves. Adani Foundation provides good Quality dry and green fodder to 24 Villages. Project is covering total 14116

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									<p>Cattels / 3008 farmers and hence enhancing cattle productivity during last FY 2022-23.</p> <ul style="list-style-type: none"> Awareness of mangroves importance in surrounding communities & Fodder support - The expenditure for fodder supporting activities was approx. 200.89 Lacs during FY 2022-23 which was incurred by APSEZ. Individual Fodder Cultivation: Farmers were Aware, Convince and trained to cultivate super Napier Grass as on farm projects to reduce their Fodder Dependency and expense. With that effort 192 farmers have Adopted and Cultivated Super NAPIER Grass in 190-acre area and produce 3800 Fodder Tons Yield annually,

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									<p>lead to save Approx Rs 52 Lacs of farmers.</p> <ul style="list-style-type: none"> • Grass Land development: AF converted 205 acres of denuded village common pastureland gauchar into fertile and productive grassland in Zarpara and siracha village to transform into Fodder Sustain village with Community participation and responsibility for maintain and Monitoring. • Among that 18 Acre of Guchar land is fenced and sowed with Multispecies Green Fodder with Having Good nutritive value More than 2250 Cattle will sustain with Improving quality and Quantity of Milk. • Other than this dedicated security guard with gate system deployed by APSEZ

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							<div> <div></div> <div></div> <div> <p>across the coastal area and no unauthorized persons allowed within coastal as well as mangrove areas.</p> <ul style="list-style-type: none"> APSEZ has celebrated the International Day for the Conservation of the Mangrove Ecosystem on July 26th to raise awareness of the importance of mangrove ecosystems as "a unique, special and vulnerable ecosystem". The photographs of celebration were submitted in previous compliance period Apr'22 to Sep'22. Refer CSR report attached as Annexure – 2. </div> </div> <p>To comply with the GCZMA recommendations regarding mangrove monitoring at every 2 years, APSEZ earlier awarded work order to NCSCM, Chennai vide order no. 4802018994, dated 29/07/2022 with cost 23.77 Lacs for mangrove mapping in and around APSEZ, but due to some financial disputes and no</p>

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							<p>proper response from NCSCM side regarding resolution, the work order has been revoked.</p> <p>After that as suggested by Joint Review Committee in its report that mangrove related studies may be undertaken by different agencies on a rotation basis for a better review of the mangroves, APSEZ issued work order to the Gujarat Institute of Desert Ecology (GUIDE), Bhuj vide order no. 4802027981, dated 10/04/2023 for mangrove mapping in and around APSEZ, Mundra. The cost of said work is 23.60 Lacs (Including Taxes), which will be paid by APSEZ..</p> <p>Other than this Adani Foundation – CSR Arm of Adani Group at Mundra-Kutch has initiated multi-species plantation of mangroves in Luni village in association with GUIDE, Gujarat. During 2018-2019 (Phase-I) multi-species mangrove plantation was carried out in 10 ha, during Phase-II (2019-2020) it was 02 ha and during Phase III (2020-2021) it is 01 ha. During FY 2021-22, 03 ha area coastal stretches have been planted with species. During current FY 2022-23, 04 Hecter plantation has been planted with various species. Total 20 Ha. multi-species mangrove plantation has been carried out till March-23 association with M/s. GUIDE,</p>
1.4	Development activities along the coast might cause		Detailed hydro-dynamic modelling and	It is recommended to map the coastal morphology (Shoreline) at	APSEZ	Continual Process	Shore line change study was carried out by M/s. Chola MS, Chennai (NABET accredited consultant) as a part of Waterfront Development Project – Expansion EIA study. The summary of the said study is as below.

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	certain changes in hydro-dynamic characteristics along the shoreline. Shoreline of any area also can be influenced by storm surges and other natural processes.		shoreline change prediction for a fully developed APSEZ facility has been studied. The study reveals that the erosion and accretion in the study area at the end of 15th year will be within the designated criteria of ± 0.5 m/year, which reconfirms that the waterfront development activities of APSEZ would	least once in three years			<p>To estimate the shoreline change due to the earlier approved waterfront development plan, a historical shoreline change assessment has been undertaken using the satellite imagery for a period of 2008 to 2018. In order to avoid any major errors in estimating the shoreline, the satellite data for similar tidal condition was considered for 2008, 2013 and 2018. AMBUR Methodology was used to study the historical analysis</p> <p>10km radius stretch of shoreline on either side of the APSEZ project boundary has been considered for assessing the historical shoreline change scenario. The baseline shoreline change assessment depicts the influence of both natural causes and also possible changes in the shore due to various development activities in the study area during the designated period. For the purpose of this study, shoreline on left side of APSEZ is termed as West Side Shoreline and that of the right side as East Side Shoreline for ease of recognition.</p> <p>The maximum accretion and erosion rate of the west side shoreline over a period of 10 years during the year 2008 – 2018 are observed to be 4.78 m/yr and 1.93 m/yr respectively.</p> <p>The maximum accretion and erosion rate of the east side shoreline over a period of 10 years during the year 2008 – 2018 are observed to be 0.5 m/yr and 0.82 m/yr respectively.</p>

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			pose insignificant impact on the Mundra shoreline.				<p>APSEZ had also awarded work to the agency namely M/s. Gujarat Institute of Desert Ecology, Bhuj for carrying out Shoreline Change Assessment Study for Mundra region vide P.O. No. 4802013270 dated 30.03.2022. The cost of said study is INR 17.39 Lacs.</p> <p>Shore line change study was carried out by M/s. Gujarat Institute of Desert Ecology, Bhuj as a part of the Environmental Management Plan (EMP) compliance with the CIA study.</p> <p>In the present study, the rate of shoreline changes statistics on a time series of multiple shoreline positions of a totally 43 km coastline stretches (16 km on the west side and 27 km on the east side of Adani main port) on either side of Adani Ports and Special Economic Zone Ltd (APSEZL) has been taken into account for the calculation by using satellite images.</p> <p>As a part of the NGT direction, the shoreline change analysis has been carried out for the years 2015-2022 to study the immediate changes after the commissioning of the port and initiation of the activities (September 2015) for short-term variation for the year 2015-2022 using EPR method has been carried out.</p> <p>The details of the rate of shoreline changes (Short interval time) recorded from 2015 to 2022 are</p>

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude1	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance																			
							<div>summarized in below table.</div> <table><tr><th>Period</th><th>Name of the block</th><th>Average Shoreline Change(M /Year)</th><th colspan="2">Shoreline Change(M)</th></tr><tr><td></td><td></td><td></td><th>Maximum Accretion</th><th>Maximum Erosion</th></tr><tr><td rowspan="2">2015-2022</td><td>West Port</td><td>-11.43</td><td>39.86</td><td>-78.68</td></tr><tr><td>Eastern side</td><td>-26.60</td><td>191.32</td><td>-165.19</td></tr></table> <div>The Shoreline Change Assessment Study report of GUIDE is attached as Annexure- 9.</div>	Period	Name of the block	Average Shoreline Change(M /Year)	Shoreline Change(M)					Maximum Accretion	Maximum Erosion	2015-2022	West Port	-11.43	39.86	-78.68	Eastern side	-26.60	191.32	-165.19
Period	Name of the block	Average Shoreline Change(M /Year)	Shoreline Change(M)																							
			Maximum Accretion	Maximum Erosion																						
2015-2022	West Port	-11.43	39.86	-78.68																						
	Eastern side	-26.60	191.32	-165.19																						
2	Regional Traffic Management Plan																									
2.1	The projected traffic data as per the EIA Report of Multi-Product Special Economic Zone, the peak vehicular traffic from the port and SEZ	Level-1	As per the master plan of APSEZ, eight artillery roads will be connected to either state highway or national highway for evacuating the goods from APSEZ. None of these roads	Additional road as per master plan will be built in future based on the overall progress of the project. Currently about 25% of cargo from APSEZ is transported by Rail and the same will be enhanced to 40% when the facility	APSEZ	As and When Required	<div>Presently, ~ 51.7 % of the total SEZ is developed. Based on technical studies,</div> <div>Existing road/rail/conveyer infrastructure facilities are adequate to evacuate the existing cargo. Further, APSEZ's cargo evacuation through rail / conveyer / pipeline has increased to ~34.28%, thereby reducing the usage of road.</div> <div>Additional road facilities will be built as per master plan considering future development.</div> <div>The facilities for transportation of cargo other than road will be enhanced considering future development, which will reduce the traffic volumes on the regional road Network.</div>																			

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	<p>operations (including supporting facilities and colony) could be in the order of 18,300 and 10,400 vehicles per day respectively .</p> <p>There could be a possible increase in traffic congestions on village-highway intersections and road accidents.</p>		<p>are passing through settlements, thereby avoiding traffic Congestions in the respective villages. The carrying capacity of the eight artillery roads connecting APSEZ is estimated to be about 16,000 PCU/hr as against the envisaged peak traffic volume of 4,500 PCU/hr.</p>	<p>is fully developed in future. This will further reduce the traffic volumes on the regional road network.</p>			

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			Out of eight artillery roads considered in APSEZ master plan, seven roads were already developed and functional.				
			APSEZ has been imparting Driver Training Programs to all their contractors to enhance awareness on road safety.	APSEZ can undertake technical feasibility of implementing Intelligent Transport System (ITS) for the freight carriers associated with their development activities.	APSEZ & GSRDC*	Long Term	APSEZ is being imparting the regular in-house training awareness program in different mode i.e., classroom, on-job training, virtual platform & Assessment by internal & external trainer to all drivers and employees on below topics: <ul style="list-style-type: none"> ✓ ✓ Basic induction Training for drivers ✓ ITV Driver Training ✓ ITV Driver Induction for Supervisor ✓ Defensive Driving for LMV & HMV ✓ Defensive Driving & BBS ✓ Driver Assessment ✓ Road accident & rescue ✓ Traffic Management & Road Signage ✓ Driving safety training ✓ RORO Driver training ✓ Road Safety

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							<ul style="list-style-type: none"> ✓ Defensive Driving & Emergency Action Plan ✓ Drivers Responsibilities & Safe driving ✓ Emergency Rescue (Vehicle) Training <p>Approx. 9307 Participants (On roll and contractual manpower) were benefitted from above trainings in compliance period Oct'22 to Mar'22. The same will be continued in future also.</p> <p>APSEZ has also implemented the Remote traffic management system (RTMS) to manage the traffic movements and capturing the violations to further improve the system.</p> <p>Following steps were taken by APSEZ to reduce the accidents.</p> <ul style="list-style-type: none"> ✓ Handling and escorting of the ODC for ensuring the smooth movement on the roads. ✓ Traffic Awareness programs for the drivers and regular briefing of the drivers in the parking areas. ✓ Incident handling and root cause analysis for taking necessary action in order to avoid such incidents. ✓ BAC checks for the drivers in order to identify the intoxicated drivers and necessary action is being taken against them. ✓ Water spray drive at gates are being conducted on regular basis during night hours to avoid dozing by the driver while driving.

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							<ul style="list-style-type: none"> ✓ RTMS devices are being installed at 08 critical locations in order to capture speed violations and enforcing road safety regulations. ✓ Display of traffic signages and lane markings on road in coordination with the Civil team for ensuring road safety rules are being followed by the road users. ✓ We have approx. 100+ cameras which are being utilized for monitoring of traffic movement through CCTV and timely response in order to avoid any congestion and during traffic incidents. ✓ Regular traffic checks by Traffic Marshalls in order to ensure road safety rules (Wearing seat belt/Wearing helmet/Carrying driving license/Speed checks/Documents) is being followed by the drivers. ✓ Installation of Road furniture's (Cones/Water filled barriers/Cats eye/Spring Posts/Jersey Barriers) for lane segregation, Channelizing the traffic, at Junctions and indicating Caution for the road users.
3	Water resources Management and sewage treatment & disposal Plan						
3.1	For a fully developed APSEZ facility, water demand will be in the	No-Impact	APSEZ is meeting the current water demand through Narmada	As per the master plan and permissions granted under EC, APSEZ will be developing progressively	APSEZ	As and When Required	<p>Presently there are two fresh water sources available with APSEZ.</p> <p>Desalination Plant – 47 MLD</p> <p>Gujarat Water Infrastructure Limited (GWIL) – 9 MLD (sanctioned capacity).</p> <p>Current water demand for APSEZ along with SEZ</p>

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	order of 4,30,000 m ³ /day (430 MLD). APSEZ will be sourcing majority of the water from the captive desalination plants, which will be developed in progressive manner.		water supply scheme and 47 MLD captive desalination plant at site. Necessary water allocation from concerned authorities was obtained and the same will be renewed from time to time as per the directions of state government.	4,50,000 m ³ /day (450 MLD) of desalination plants to meet the future demand. Hence stress on regional water resources due to these developmental projects will be less significant.			industries including Adani Power Plant is an avg. of 23.86MLD. So presently, these sources are adequate to fulfill the current freshwater requirement of entire APSEZ including member units. The desalination plant of additional capacities will be installed on modular basis considering future requirement of APSEZ.
3.2	Existing water demand in the Mundra taluk is estimated	Level-2	Adani Foundation has been contributing to various watershed	Adani Foundation is planning to implement the various water resource	APSEZ and CGWB*	Long Term	Water needs of APSEZ is being met through existing Desalination Plant of APSEZ and GWIL which may be further enhanced on modular basis. At present Ground water is not utilized for any activities within APSEZ. However various works are being carried out by Adani

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	as 8500 m ³ /day (@55 lpcd) and the potable and sanitation water needs would increase to 37,000 m ³ /day (@125 lpcd) in future when the area is fully grown into larger municipality due to induced economic growth. Water demand of the local communities is met through		development projects in the Mundra region to enhance ground water resources in the area. Adani Foundation has contributed about Rs. 300 Lakhs so far for the development of 18 check dams.	conservation programs in next ten years under various schemes.			<p>Foundation continuously under Water Conservation Work to achieve water security in Mundra region by Adani Foundation. Following works are carried out as a part of water conservation work since April – 2018. Water conservation Projects i.e. Roof Top Rain Water Harvesting, Desilting of Check dams, Bore Well Recharge and Pond deepening were taken up in past years, review and monitoring of all water harvesting structures had been taken up.</p> <p>To make connections between human actions and the level of biological diversity found within a habitat and/or ecosystem, this year Adani Foundation launch project "Sanrakshan" in coordination with GUIDE and Sahjeevan.</p> <p>Since, 10 years considerable Water Conservation Work carried out in Mundra Taluka. Due to satisfactory rain in current year 1.11 mtr ground water table increased as per increased in coastal belt of Mundra as per Government Figures.</p> <p>Our water conservation work is as below.</p> <ul style="list-style-type: none"> • Large number of water harvesting structure (18 Nos. of check dams in coordination with salinity department) and Augmentation of 3 check dams • Ground recharge activities (pond deepening work for 61 ponds) individually and 26 ponds under

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	Narmada water supply system to some extent, but largely depending on the ground water in the study area. Mundra block is reported to be a safe ground block as on date. Due to influx of people and rapid urbanization due to the economic development, there could be						<p>Sujlam Suflam Jal Abhiyan were built leading to a significant increase in water table and higher returns to the farmers</p> <ul style="list-style-type: none"> • New Pond Deepening Under Ajadi ka Amrut Mahotsav done in Goyarsama village Approx Deepening Capacity is 12000 Cum. • Roof Top Rain Water Harvesting 145 Nos. (40 Nos current year) which is having 10,000 litre storage which is sufficient for one year drinking water purpose for 5 people family. • Recharge Bore well 208 Nos which is best ever option to direct recharge the soil. • Drip Irrigation approx. 1506 Farmers benefitted in coordination with Gujrat Green Revolution Company till date • Bund construction on way of Nagmati River could save more than 575 MCFT water quantity which recharged in ground due to which bore well depth decreased by 50-100 Ft in Zarpara, Bhujpur and Navinal Vadi Vistar. • Check dam gate valve construction at Bhujpur which controlled more than 350 MCFT water to go into sea and get recharged current year. • Pond Pipeline work at Prasla Vistar Zarpara which increase recharge capacity more than 25% in 100 hector area. <p>With the objective of to preserve the rainwater to reduce the impact of salinity and recharge the ground</p>

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	some stress on the ground water resources in future.						<p>water (the main source of water) to facilitate the Agricultural activities as well as for drinking water.</p> <p>Adani foundation has spent approx. INR 7574.54 lakhs from April – 2018 to Mar– 2023 for CSR activities which also includes water conservation projects as mentioned above.</p>
3.3	It is estimated that about 60,000 m ³ /day (60 MLD) of sewage will be generated from the APSEZ facility when the project is fully developed.	No Impact	Seven sewage treatment plants with an aggregate capacity of 3.1 MLD have already built at APSEZ. Treated sewage is utilized for greenbelt development and sewage is not discharged into either seasonal natural streams or	APSEZ is permitted to develop decentralized sewage treatment plants of total 62 MLD capacities. Existing sewage treatment facilities will be augmented progressively based on the development at APSEZ in future. Similar to existing practices, treated sewage will be utilized	APSEZ	As and When Required	<p>Current installed capacity of wastewater treatment plants is 6.255 MLD (ETP, STPs & CETP) for treatment of effluent & sewage generated at various locations of APSEZ excluding wastewater treatment plants installed within industrial member units.</p> <p>Out of 54, only 4 operational industries within the SEZ are sending their partially treated industrial as well as domestic effluent to the CETP conforming to CETP inlet norms for further treatment and final disposal. Other SEZ industries have their own STPs / ETPs for treatment of wastewater generated from their industrial operation and discharging the treated water on land for horticulture purpose within their premises as per specific permission granted by SPCB.</p> <p>APSEZ also granted permission to treat 2.5 MLD of sewage generated from Mundra village through CETP and STP.</p> <p>Presently avg. 2.13 MLD of wastewater (in to ETP, STPs & CETP) is treated and being utilized on land for</p>

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			marine environment.	for greenbelt development.			horticulture purpose within APSEZ premises during Oct'22 to Mar'23. Existing wastewater treatment plants are adequate to treat and handle the total effluent / sewage load considering current development. Existing wastewater treatment facilities will be augmented, or new plants will be developed on modular basis considering future requirement.
4	Air quality management Plan						
4.1	Although all the regulated activities in the study area will be adopting promulgated emission norms, total air emission mass discharge from the study area would increase.	Level-2	APSEZ and other thermal power plants have obtained valid consent to operate and have been operating the facilities as per the emission norms stipulated in respective consent	All existing and new industrial establishments will obtain requisite consents from GPCB and adhere to the stipulated emission norms regulations and guidelines issued by authorities from time to time.	APSEZ And Other Industries	Continual Process	APSEZ has been granted requisite permissions from the concerned authorities with stipulated norms for air emission (flue gas as well as ambient air). Ambient Air Quality monitoring is being carried out by NABL accredited and MoEF&CC authorized agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi for APL as per NAAQ standards, 2009. Stack emission monitoring is also being carried out on regular basis. Reports of the same are being submitted to the concerned authorities on regular basis. Adani power plant has installed continuous emission and air quality monitoring instruments as per CPCB Directive and submitting the reports also. Another power plant of CGPL is outside APSEZ area. The AAQM summary for last six months (Oct'22 to

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			orders. APSEZ and other two power plants are monitoring the ambient air quality on regular intervals as per GPCB/CPCB guidelines and the data is analyzed and presented to GPCB on monthly basis. Both the thermal power plants located within the study area have installed continuous				<p>Mar'23) are as below.</p> <p>Locations: 16 Nos. (APSEZ – 13 + APL – 3 including 4 villages)</p> <p>Frequency: Twice in a week</p> <table><tr><th>Parameter</th><th>Unit</th><th>Min</th><th>Max</th><th>Average</th><th>Perm. Limit[§]</th></tr><tr><td>PM₁₀</td><td>µg/m³</td><td>41.79</td><td>89.86</td><td>75.53</td><td>100</td></tr><tr><td>PM_{2.5}</td><td>µg/m³</td><td>14.19</td><td>49.12</td><td>33.05</td><td>60</td></tr><tr><td>SO₂</td><td>µg/m³</td><td>8.80</td><td>36.63</td><td>22.40</td><td>80</td></tr><tr><td>NO₂</td><td>µg/m³</td><td>11.30</td><td>43.65</td><td>29.48</td><td>80</td></tr></table> <p>[§] as per NAAQ standards, 2009 Values recorded confirms to the stipulated standards.</p> <p>Approx. INR 15.32 Lakhs is spent by APSEZ for environmental monitoring activities during the FY 2022-23, which also includes ambient air quality monitoring for overall APSEZ, Mundra.</p> <p>Other industries located within the SEZ have obtained requisite permissions from the competent authorities for their respective plant and they also carried out environmental monitoring within their premises to comply with the permission granted. The same has been ensured by APSEZ as well as SPCB during their regular visits. APSEZ carries out regular</p>	Parameter	Unit	Min	Max	Average	Perm. Limit [§]	PM ₁₀	µg/m ³	41.79	89.86	75.53	100	PM _{2.5}	µg/m ³	14.19	49.12	33.05	60	SO ₂	µg/m ³	8.80	36.63	22.40	80	NO ₂	µg/m ³	11.30	43.65	29.48	80
Parameter	Unit	Min	Max	Average	Perm. Limit [§]																																
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			emission and air quality monitoring instruments as per CPCB directive.				<p>visits/inspections of member industries within SEZ and last visit was conducted during February to March, 20223 for EMS & compliance verification. During compliance verification, it was verified that monitoring of air emission was well within the permissible standards based on analysis reports. Same will be continued in future also.</p> <p>The monitoring reports of industries within SEZ are also being submitted to the regulatory authorities as a part of half yearly Compliance report of EC for Multi-Product SEZ.</p>
				A common air quality management committee may be framed under the guidance of the State Pollution Control Board and district administration to manage regional level emission inventory data that can help to manage regional	APSEZ and Other Industries, Stakeholders, District Administration and GPCB*	Long Term And Continual	<p>APSEZ will co-operate and comply with the directions from concerned regulatory authorities for air quality management within APSEZ area. However, at present, APSEZ has formed Internal Environment Monitoring Committee, involving officials from APSEZ, Adani Power Limited and other SEZ member units with following role and responsibilities:</p> <ul style="list-style-type: none"> • Identification of sources of air & noise emission and its dispersion in surrounding villages • Remedial measures to eliminate, control, reduce or capture air & noise emission • Identify available resource to abate the air and noise emission • Required additional resources for control of air and noise emission

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				level air quality management goals.			<ul style="list-style-type: none"> • Drinking water and its testing of all the available fresh water sources in surrounding villages • Identify any surrounding villages affected by organization's improper waste disposal mechanism. <p>Last committee meeting was conducted on dated 11/04/2023 and below was the point of discussion for way forward.</p> <ul style="list-style-type: none"> • Brief introduction about the Environment Management Plan (EMP) • All members conveyed his environment management practices, issue & suggestions • Discussed about the various ways to improve existing practice to control the emission in terms of Air, Water and Noise. • Discussed about the proper management of the canteen waste. • Discussed about the cleaning of outside of the SEZ units. • Discussed about the management of rain water & proper cleaning of the common storm water drainage system. • Discussed about proper segregation & disposal of solid waste material. • Discussed about to increase more green belt area inside plant premises of SEZ units

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							APSEZ and all the industries within SEZ are complying to NAAQS and same is being ensured by APSEZ. The monitoring reports of industries within SEZ are being submitted to the regulatory authorities as part of half yearly Compliance report of EC for Multi-Product SEZ.
4.2	Release of particulate emissions from handling and storage of coal at the port and power plants would influence PM10 and PM2.5 concentration in the background air. This could pose some health impacts such as asthma and	Health Impact	APSEZ has been implementing the following management plan to control emissions as per the applicable regulations and similar practices will be adopted in future: Entire bulk material handling facilities are mechanized. Regular water	All industries located in the APSEZ shall adhere to the emissions norms and minimum stack height guidelines issued by CPCB and consent to operate issued by Gujarat Pollution Control Board from time to time.	APSEZ and Other Industries	Continual Process	<p>Following safeguard measures are taken by APSEZ for abatement of dust emissions.</p> <ul style="list-style-type: none"> Adequate stack heights to the Boilers, D.G. Sets, TFHs & HWGs for proper dispersion of pollutants within APSEZ Using of liquid & Gaseous fuels instead of solid fuels in Boilers, Thermic fluid heaters and hot water generators. Regular sprinkling on road and other open area Regular cleaning of roads Dry fog Dust Suppression System (DSS) in hopper, transfer towers and conveyor belts Use of water mist canon Closed type conveyor belts Regular sprinkling on coal heaps Covering other types of dry bulk cargo heaps Installation of wind breaking wall Development of greenbelt along the periphery of the storage yards/back up area Mechanized handling system for coal and other dry bulk cargo Wagon loading and truck loading through closed

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	COPD etc. among the local communities.		sprinkling on road and other open areas, regular cleaning of roads, dry fog dust suppression systems (DSS) in hoppers, transfer towers and conveyor belts, use of water mist canon, covered conveyor belts, regular sprinkling on coal heaps,				<p>silo</p> <p>Adequate air pollution control measures like ESPs, FGDs, Bag Filters, etc. and adequate stack heights provisions are implemented within the thermal power plant.</p> <p>The stack monitoring summary for last six months (Oct'22 to Mar'23) are as below.</p> <p>Total Nos. of Stacks: 23 Nos. Frequency: Monthly / Half Yearly</p> <table><tr><th>Parameter</th><th>Unit</th><th>GPCB Limit</th><th>Min</th><th>Max</th><th>Avrg.</th></tr><tr><td>PM</td><td>mg/ Nm³</td><td>150</td><td>13.49</td><td>26.68</td><td>21.35</td></tr><tr><td>SO₂</td><td>Ppm</td><td>100</td><td>6.18</td><td>17.36</td><td>8.52</td></tr><tr><td>NO_x</td><td>ppm</td><td>50</td><td>15.24</td><td>28.58</td><td>21.93</td></tr></table> <p>Values recorded confirms to the stipulated standards.</p> <p>Approx. INR 15.32 Lakhs is spent by APSEZ for environmental monitoring activities during the FY 2022-23, which also includes ambient air quality monitoring for overall APSEZ, Mundra.</p> <p>All other industries located within SEZ are adhere to provide adequate stack height and pollution control measures for proper dispersion of pollutants as per respective permissions granted by the board. The same</p>	Parameter	Unit	GPCB Limit	Min	Max	Avrg.	PM	mg/ Nm ³	150	13.49	26.68	21.35	SO ₂	Ppm	100	6.18	17.36	8.52	NO _x	ppm	50	15.24	28.58	21.93
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							is being inspected and ensured by APSEZ as well as SPCB officials on regular basis.
			covering of other types of dry bulk cargo heaps by protective materials, installation of wind breaking wall, development of greenbelt along the periphery of the storage yards/back up area and mechanized handling system for coal and other dry bulk cargo and Wagon loading and	An internal Coal Dust Management Working Group shall be formed by APSEZ to effectively co-ordinate the approach to coal dust management and monitoring	APSEZ and Other Industries, Concerned Stake holders, District Administration*	Long Term	<p>As mentioned above, presently, APSEZ has formed Internal Environment Monitoring Committee, involving Officials of APSEZ, Adani Power Limited & other member units, with specific role and responsibilities as defined above.</p> <p>The dry cargo is being handled by mechanized system and transported by covered conveyer system, trucks and rail wagons.</p> <p>Wind breaking wall is provided around the coal storage yards of APSEZ as well as Adani Power Plant.</p> <p>Adequate air pollution control measures like ESPs, FGDs, Bag Filters, etc. and adequate stack heights provisions within the thermal power plant for proper dispersion of pollutants.</p> <p>Green belt / plantation is provided around the periphery of dry cargo storage area and regular water sprinkling is also being done to abate the dust emission from coal hips.</p> <p>Last committee meeting was conducted on dated 11/04/2023 and below were the point of discussion for way forward.</p>

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			truck loading through closed silo. Both thermal power plants in the study area have installed electrostatic precipitators on the boilers and are meeting the emission norms as per the respective ECs granted. Due to installation of tall stacks as per CPCB guidelines and EC conditions, the relative air pollution impacts due				<ul style="list-style-type: none"> • Brief introduction about the Environment Management Plan (EMP) • All members conveyed his environment management practices, issue & suggestions • Discussed about the various ways to improve existing practice to control the emission in terms of Air, Water and Noise. • Discussed about the proper management of the canteen waste. • Discussed about the cleaning of outside of the SEZ units. • Discussed about the management of rain water & proper cleaning of the common storm water drainage system. • Discussed about proper segregation & disposal of solid waste material. • Discussed about to increase more green belt area inside plant premises of SEZ units

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			to release of emissions from two power plants is insignificant.				
4.3	Ships are one of the significant sources of SO ₂ and NO _x emissions in the study area. Marine diesel engines on the ships often utilize fuel oils that might contain higher sulphur content. As per the international best	Level-2	A Standard Operating Procedure (SOP) has been developed to be included as a part of APSEZ environment management plan to verify that all ships anchored at the port are adopting the MARPOL4 regulations.	The current global limit for Sulphur content of ships fuel oil is 3.5 % m/m (mass by mass). According to MARPOL, the new global cap on sulphur in the marine vessel fuels will be 0.50% m/m by the 1st January 2025. APSEZ should explore the possibility of providing shore power to the ships at the port	APSEZ and Ship Owners	Long Term	The ships coming to the APSEZ is complying with MARPOL and other shipping rules and regulations. APSEZ has already started providing shore power supply to the tugs (11 Nos.), dredgers (2 Nos.) and barges (1 No.). The feasibility of shore power will be explored and implemented on large scale for the visiting vessels to reduce idling stage ship emissions.

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	practices, these marine diesel engines are designed to meet MARPOL regulations with NOX emissions less than 14.4 gram/Kwhr of engine. Due to lower stack heights of the marine diesel engine, ship emissions often gets dispersed in the local environment and might pose risk of			to reduce idling stage ship emissions.			

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	fumigation during the early morning and evening hours due to atmospheric inversion break-up periods.						
4.4	Road vehicle emissions will be other major contributors to the air pollution in the region when the facility is fully developed.	Level-2	Not Applicable	Due to implementation of Bharat VI fuels (MoEF&CC)6 in near future the vehicular and diesel engine emissions will be reduced by about 50% from the current national levels. APSEZ should develop a robust contractor environmental policy to ensure that Bharat	APSEZ and All Industries	Short Term	<p>Presently, cargo evacuation through rail / conveyer / pipeline has increased to ~34.28 %, thereby reducing the usage of road.</p> <p>Vehicles having valid PUC certificate are only being allowed to enter within APSEZ area.</p> <p>In future, APSEZ will also explore the feasibility of using Electric Vehicles for internal cargo movement.</p> <p>APSEZ, has procured 183 nos. of Electrical Vehicle for internal cargo movement and will increase more nos. of E-ITVs in phase wise as per business requirement.</p> <p>As well as procured 05 nos. LMV E-Vehicles for manpower movement and proceed for 10 nos. of more E-Vehicle procurement.</p>

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				Stage VI emission norms are adopted by all their contractors and sub-contractors.			Electrification of Rail Corridor from Dhrub Railway Station to Adipur Railway Station is going on and approx. 85% work has completed & balance work will be completed at earliest. Electric Locomotive will help to reduce the gaseous emission and increase efficiency of transportation by rail.
5	Noise emissions						
5.1	Noise emissions are envisaged from port operations, industrial operations and power plants in the study area. Any increase in noise levels beyond three	Level-1	Due to adoption of various mechanized operations at the waterfront development, the noise emissions from the port cargo handling will be minimal. An adequate greenbelt is being developed by	APSEZ, all the tenant industries and facilities within APSEZ are required to undertake noise monitoring at their facilities to demonstrate the compliance with the Noise level standards. Continuous noise recording units can be installed by APSEZ at facility boundary to address the	APSEZ	Continual Process	<p>Below Safeguard measures are already taken for abatement of noise emissions.</p> <ul style="list-style-type: none"> • Development of greenbelt along the periphery of the operational area. • D.G. Sets having Acoustic enclosures. • Maintenance of plant machineries and equipment's on regular frequency. <p>Noise monitoring is being carried out by NABL accredited and MoEF&CC authorized agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi as per permission granted and reports are being submitted to the concerned authorities on regular basis.</p> <p>The noise monitoring summary for last six months (Oct'22 to Mar'23) are as below.</p>

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude ¹	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance																		
	decibels from the background levels would be perceived as noise nuisance (USEPA)7.		APSEZ to further reduce any residual impacts due to noise emissions from the facility. Periodic noise level monitoring programs were adopted by APSEZ. Predicted noise levels were found to be well within the designated noise standards for Industrial facilities.	community grievances, when ever required. To assess the overall site wide compliance and also to address any community grievances related to noise issues due to operation of APSEZ facilities.			<div>Locations: 13 Nos. Frequency: Once in a month (24 hourly)</div> <table><tr><th>Noise</th><th>Unit</th><th>Leq Max</th><th>Leq Min</th><th>Leq Avr.</th><th>Leq Perm. Limit[§]</th></tr><tr><td>Day Time</td><td>dB(A)</td><td>69.9</td><td>57.9</td><td>64.59</td><td>75</td></tr><tr><td>Night Time</td><td>dB(A)</td><td>64.8</td><td>52.6</td><td>59.43</td><td>70</td></tr></table> <div>§ as per GPCB standards</div> <div>Approx. INR 15.32 Lakhs is spent by APSEZ for environmental monitoring activities during the FY 2022-23, which also includes ambient air quality monitoring for overall APSEZ, Mundra.</div> <div>All the results are well within the standards. From this it can be inferred that there no impacts on the surrounding community.</div> <div>All other industries located in the APSEZ are adhere to monitor and control the ambient noise level as per permission granted by SPCB and same is being confirmed by APSEZ as well as SPCB on regular basis.</div> <div>Further, till date APSEZ has not received any grievances/notice for noise issues from any of the stakeholders.</div>	Noise	Unit	Leq Max	Leq Min	Leq Avr.	Leq Perm. Limit [§]	Day Time	dB(A)	69.9	57.9	64.59	75	Night Time	dB(A)	64.8	52.6	59.43	70
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				In order to address the public grievances related to noise from the facility, an internal Noise Management Committee can be formed by APSEZ to investigate the root cause and to develop and implement noise mitigation plans in the specific zones.	APSEZ	Continual Process	<p>As mentioned above, presently, APSEZ has formed Internal Environment Monitoring Committee, involving Officials of APSEZ, Adani Power Limited & other member units, having role and responsibilities as defined above.</p> <p>Last committee meeting was conducted on dated 11/04/2023 and below were the point of discussion for way forward.</p> <ul style="list-style-type: none"> • Brief introduction about the Environment Management Plan (EMP) • All members conveyed his environment management practices, issue & suggestions • Discussed about the various ways to improve existing practice to control the emission in terms of Air, Water and Noise. • Discussed about the proper management of the canteen waste. • Discussed about the cleaning of outside of the SEZ units. • Discussed about the management of rain water & proper cleaning of the common storm water drainage system. • Discussed about proper segregation & disposal of solid waste material. • Discussed about to increase more green belt area inside plant premises of SEZ units

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							No grievance received for noise related issues, and it is observed that ambient noise level are well within the permissible standards.
6	Surface water quality (Terrestrial and Marine)						
6.1	In general, release of untreated wastewater from industrial facilities would pose threat to water quality of streams, estuaries and marine water bodies.	Level -1	As per the master plan of APSEZ, 67 MLD of wastewater is expected to be generated from the fully developed project scenario, for which necessary permissions to set up decentralized CETPs of various capacities are already obtained. Presently a CETP	As per the master plan of APSEZ, the existing CETP shall be augmented to 67 MLD in progressive manner based on the future demand. The facility should limit the marine discharge of treated industrial wastewater to 16 MLD as per the permits. Remaining treated wastewater shall be utilized for horticulture purpose.	APSEZ	As and When Required	<p>APSEZ has installed Common Effluent Treatment Plant (CETP) having 2.5 MLD capacities for treatment of partially treated effluent and sewage generated from industries within SEZ.</p> <p>Currently, CETP receives 914.24KLD (Avg.) hydraulic load and considering the current development scenario, existing CETP is adequate to treat and handle the total effluent load coming from industries within SEZ.</p> <p>Out of 54 only 4 industries within SEZ are sending their partially treated industrial as well as domestic effluent to the CETP confirming CETP inlet norms for further treatment and final disposal. Other industries within SEZ have their own STPs / ETPs for treatment of wastewater generated from their industrial operation and discharging the treated water on land for horticulture purpose within their premises as per permission granted by SPCB.</p> <p>The capacities of CETP will be enhanced on modular basis as per future requirement.</p>

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			capacity of 2.5 MLD is in place. Presently member units treat their effluents to meet the CETP inlet norms and then send it to CETP. Treated wastewater from CETP meets the stipulated discharge norms for utilization for greenbelt development within the APSEZ areas.				Presently avg. 2.13 MLD (from CETP, ETP & STPs) of treated water is being utilized on land for horticulture purpose within APSEZ premises during period Oct'22 to Mar'23 and no discharge is made to any other source.
			Online wastewater quality	Efforts shall be made to recycle complete treated	APSEZ	Based on outcome Techno-feasibility Study	Online continuous effluent monitoring system (CEQMS) installed at the discharge point of CETP to track any deviation from discharge norms. CEQMS is

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			monitoring systems are installed at CETP to ensure quality of treated effluent meets the requisite discharge norms. No wastewater from CETP is discharged into natural bodies as on date..	wastewater for port operations and industrial operations of APSEZ in future based on a detailed techno-economic feasibility study.			connected with CPCB/GPCB server & data is continuous transferring in both servers. Presently entire quantity of treated water from CETP is used for gardening / horticulture purpose within APSEZ premises.
			Runoff during monsoon from coal storage yards is collected in sedimentation ponds (dump pond)	Storm water runoff from the facility during the first rain shall be sampled and analyzed for the presence of heavy metals or other criteria pollutants to	APSEZ	Continual	There are provision of drains around coal stack yard to carry to runoff water to dump ponds. This water is either used for dust suppression or after sedimentation (to remove residual dust), is allowed disposal to sea. Presently Marine monitoring is being carried out once in a month by NABL and MoEF&CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi for APSEZ & APL both. The analysis reports of the same are being submitted to the

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			to remove any residual dust particulates for further disposal into sea	adopt corrective and preventive actions to protect the marine water quality. All red and hazard category industry within APSEZ shall adopt spill prevention and control program and no effluents shall be discharged into storm water-drains.			<p>concerned authorities on regular basis.</p> <p>The marine water quality monitoring summary for last six months (Oct'22 to Mar'23) is as per below.</p> <p>Locations: 14 Nos. (APSEZ – 9 + APL – 5) Frequency: Once in a Month / Half Yearly</p> <table border="1"> <thead> <tr> <th>TEST PARAMETERS</th><th>UNIT</th><th colspan="3">Cumulative Surface</th><th colspan="3">Cumulative Bottom</th></tr> <tr> <th></th><th></th><th>Min</th><th>Max</th><th>Average</th><th>Min</th><th>Max</th><th>Average</th></tr> </thead> <tbody> <tr> <td>pH</td><td>--</td><td>7.68</td><td>8.14</td><td>7.99</td><td>7.92</td><td>8.28</td><td>8.12</td></tr> <tr> <td>BOD</td><td>mg/L</td><td>BDL(MDL:1.0)</td><td>4.2</td><td>3.66</td><td>2.4</td><td>3.9</td><td>3.21</td></tr> <tr> <td>TSS</td><td>mg/L</td><td>62</td><td>148</td><td>98.44</td><td>54</td><td>162</td><td>101.07</td></tr> <tr> <td>DO</td><td>mg/L</td><td>4.1</td><td>6.22</td><td>5.31</td><td>4.6</td><td>6.32</td><td>5.52</td></tr> <tr> <td>Salinity</td><td>ppt</td><td>35.56</td><td>37.9</td><td>36.88</td><td>35.02</td><td>37.6</td><td>36.28</td></tr> <tr> <td>TDS</td><td>mg/L</td><td>35108</td><td>3721</td><td>35914</td><td>35614</td><td>3784</td><td>36437</td></tr> <tr> <td>Temperature</td><td>oC</td><td>28</td><td>30.2</td><td>29.04</td><td>28.2</td><td>30.3</td><td>29.3</td></tr> </tbody> </table> <p>BDL – Below Detection Limit MDL – Minimum Detection Limit</p> <p>Approx. INR 15.32 Lakhs is spent by APSEZ for</p>	TEST PARAMETERS	UNIT	Cumulative Surface			Cumulative Bottom					Min	Max	Average	Min	Max	Average	pH	--	7.68	8.14	7.99	7.92	8.28	8.12	BOD	mg/L	BDL(MDL:1.0)	4.2	3.66	2.4	3.9	3.21	TSS	mg/L	62	148	98.44	54	162	101.07	DO	mg/L	4.1	6.22	5.31	4.6	6.32	5.52	Salinity	ppt	35.56	37.9	36.88	35.02	37.6	36.28	TDS	mg/L	35108	3721	35914	35614	3784	36437	Temperature	oC	28	30.2	29.04	28.2	30.3	29.3
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							environmental monitoring activities during the FY 2022-23, which also includes ambient air quality monitoring for overall APSEZ, Mundra.
			Detailed marine hydrodynamic modelling studies revealed that the current and proposed dredged soil disposal practices, sea water intake and outfall facilities and desalination plant outfall etc have shown insignificant impact on the marine eco-system. As part of	Good dredging practices shall be adopted by APSEZ: (i).Improving the dredging accuracy (ii).Improving onboard automation and monitoring, (iii). Reduce spill and loss, (iv). evaluating the need for installing silt screens near mangrove areas during the dredging phase operations, (v). Environment friendly dredging activities can be undertaken in such a way that	APSEZ	Long Term	<p>No capital dredging has been done, since Apr 2015. Dredged material generated during maintenance dredging is being disposed at designated locations within deep sea as identified by NIO.</p> <p>Dredging Management plan is adopted for carrying out dredging and management of dredge material. Presently there are 3 nos. (2 Nos. Cutter suction + 1 No. Trailer suction) of dredgers are in operation for dredging.</p> <p>Marine monitoring is being carried out once in a month by NABL and MoEF&CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. The analysis reports of the same are being submitted to the concerned authorities on regular basis. Summary of marine water for the last six months is as mentioned above.</p> <p>The same practice will be continued in future also as per direction by MoEF&CC as well as GPCB.</p> <p>Monitoring will be focused near ecological sensitive area in case of need to carryout capital dragging near such areas.</p>

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			the comprehensive environmental monitoring program, APSEZ has been adopting marine water and sediment quality monitoring on monthly basis.	the overall turbidity levels near the mangrove and ecologically sensitive zones shall not exceed 100 NTU or 200 mg/l of TSS (10% lethal level of fish) Existing marine monitoring program shall be continued as per the directions of MoEF&CC and GPCB.			
7	Groundwater quality and salinity ingress						
7.1	While Mundra block is enjoying safe ground water status as on date (based on the data	Level-2	APSEZ is not utilizing ground water for any type of use. APSEZ is meeting the current water	A dedicated desalination plant of capacity 4,50,000 m3/day (450 MLD) will be developed in progressive manner to meet the APSEZ	APSEZ	As and When Required	<p>Present source of water for various project activities is desalination plant of APSEZ and/or through Gujarat Water Infrastructure Limited (GWIL) and same is sufficient to meet the present water demand.</p> <p>APSEZ does not draw any ground water.</p> <p>The desalination plant of additional capacities will be installed on modular basis considering future</p>

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	published by CGWB), due to induced economic and population growth, use of ground water resources by the local people might increase in Mundra region. This might increase the TDS and chloride levels in the ground water in future.		demand through Narmada water supply scheme and 47 MLD captive desalination plant at site.	requirements.			development and requirement.
7.2	Due to induced growth in	Level-2	Ground water is not drawn by	The Govt. of Gujarat, Narmada, Water	District Administratio	Long Term	APSEZ will co-operate and comply with the directions from concerned regulatory authorities.

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	the region, pressure on the available ground water source would increase and this could pose some threat to salinity ingress.		APSEZ for its operations. Natural streams (seasonal rivers) passing through the APSEZ area will not be disturbed, the micro-watershed in the area will not be disturbed. Due to the above reasons, the possibility of salinity ingress due to APSEZ development is not envisaged. Mundra and Anjar blocks	Resources, Water Supply & Kalpsar Dept.,(WRD)12 has been implementing various salinity ingress prevention projects	n*		<p>APSEZ does not draw any ground water for the fresh water requirement.</p> <p>However, Adani Foundation – CSR arm of Adani Group has carried out rainwater harvesting activities in the nearby villages for benefit of the locals.</p> <p>Water conservation Projects i.e. Roof Top Rain Water Harvesting, Desilting of Check dams, Bore Well Recharge and Pond deepening were taken up in past years, review and monitoring of all water harvesting structures had been taken up.</p> <p>To make connections between human actions and the level of biological diversity found within a habitat and/or ecosystem, this year Adani Foundation launch project “Sanrakshan” in coordination with GUIDE and Sahjeevan.</p> <p>Since, 10 years considerable Water Conservation Work carried out in Mundra Taluka. Due to satisfactory rain in current year 1.11 mtr ground water table increased as per increased in coastal belt of Mundra as per Government Figures.</p> <p>Our water conservation work is as below.</p> <ul style="list-style-type: none"> Large number of water harvesting structure (18 Nos. of check dams in coordination with salinity department) and Augmentation of 3 check dams

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			fall under fresh water to medium salinity zones. It can be observed that little variation was observed in the ground water salinity levels from year 2013 to 2016 across the Mundra and Anjar blocks. This aspect confirms that the overall salinity ingress from the shore into the land due to existing APSEZ				<ul style="list-style-type: none"> Ground recharge activities (pond deepening work for 61 ponds) individually and 26 ponds under Sujlam Suflam Jal Abhiyan were built leading to a significant increase in water table and higher returns to the farmers New Pond Deepening Under Ajadi ka Amrut Mahotsav done in Goyarsama village Approx Deepening Capacity is 12000 Cum. Roof Top Rain Water Harvesting 145 Nos. (40 Nos current year) which is having 10,000 litre storage which is sufficient for one year drinking water purpose for 5 people family. Recharge Bore well 208 Nos which is best ever option to direct recharge the soil. Drip Irrigation approx. 1506 Farmers benefitted in coordination with Gujrat Green Revolution Company till date Bund construction on way of Nagmati River could save more than 575 MCFT water quantity which recharged in ground due to which bore well depth decreased by 50-100 Ft in Zarpara, Bhujpur and Navinal Vadi Vistar. Check dam gate valve construction at Bhujpur which controlled more than 350 MCFT water to go into sea and get recharged current year. Pond Pipeline work at Prasla Vistar Zarpara which increase recharge capacity more than 25% in 100 hector area. .

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			facilities and power plant outfalls are less significant.				<p>With the objective of to preserve the rainwater to reduce the impact of salinity and recharge the ground water (the main source of water) to facilitate the Agricultural activities as well as for drinking water.</p> <p>Narmada Water Resources, Water Supply & Kalpsar Dept., (WRD)1 has been implementing various salinity ingress prevention projects. Under Sardar Sarovar canal project, Govt. of Gujarat has proposed to implement about 8200 Km stretch of water canal and the project is at various stages of implementation. Under this project about 112,000 ha of land in about 180 villages will be benefitted with irrigation needs. This will significantly reduce the pressure on the ground water resources in the region.</p>
				While the individual industries in the study area will continue to undertake ground water quality	All Concerned Stakeholders, District Administration and CGWB*	Continual Process	<p>APSEZ (9 Locations – half yearly) & Adani Power Ltd. (5 Locations – quarterly) is carrying out ground water sampling and reports of the same are being submitted to the regulatory authorities on regular basis.</p> <p>The summary of APSEZ ground water quality monitoring for last six months (Oct'22 to Mar'23) are as below.</p>

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				monitoring as per the environmental clearances issued for the respective projects, a regional level ground water conservation action committee can be formed under the guidance of state ground water board and district Administration.			<div>Nos. of Location: 09</div> <table><tr><th>Parameters</th><th>Unit</th><th>Min</th><th>Max</th><th>Average</th></tr><tr><td>pH @ 25 ° C</td><td>--</td><td>7.06</td><td>8.44</td><td>7.78</td></tr><tr><td>Salinity</td><td>ppt</td><td>0.79</td><td>21.38</td><td>6.12</td></tr><tr><td>Oil & Grease</td><td>mg/L</td><td>BDL(MDL: 2.0)</td><td>BDL(MDL:2.0)</td><td>BDL(MDL:2.0)</td></tr><tr><td>Hydrocarbon</td><td>mg/L</td><td>Not Detected</td><td>Not Detected</td><td>Not Detected</td></tr><tr><td>Lead as Pb</td><td>mg/L</td><td>0.03</td><td>0.07</td><td>0.05</td></tr><tr><td>Arsenic as As</td><td>mg/L</td><td>BDL(MDL: 0.01)</td><td>BDL(MDL:0.01)</td><td>BDL(MDL:0.01)</td></tr><tr><td>Nickel as Ni</td><td>mg/L</td><td>0.04</td><td>0.37</td><td>0.13</td></tr><tr><td>Total Chromium as Cr</td><td>mg/L</td><td>0.01</td><td>0.06</td><td>0.04</td></tr><tr><td>Cadmium as Cd</td><td>mg/L</td><td>0.05</td><td>0.19</td><td>0.11</td></tr><tr><td>Mercury as Hg</td><td>mg/L</td><td>BDL(MDL: 0.001)</td><td>BDL(MDL:0.001)</td><td>BDL(MDL:0.001)</td></tr><tr><td>Zinc as Zn</td><td>mg/L</td><td>0.12</td><td>0.27</td><td>0.18</td></tr><tr><td>Copper as Cu</td><td>mg/L</td><td>0.07</td><td>0.07</td><td>0.07</td></tr><tr><td>Iron as Fe</td><td>mg/L</td><td>0.12</td><td>1.12</td><td>0.64</td></tr><tr><td>Insecticides/Pesticides</td><td>µg/L</td><td>Absent</td><td>Absent</td><td>Absent</td></tr><tr><td>Depth of Water Level from Ground Level</td><td>meter</td><td>1.90</td><td>2.30</td><td>2.11</td></tr></table> <div>BDL – Below Detection Limit MDL – Minimum Detection Limit</div>	Parameters	Unit	Min	Max	Average	pH @ 25 ° C	--	7.06	8.44	7.78	Salinity	ppt	0.79	21.38	6.12	Oil & Grease	mg/L	BDL(MDL: 2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	Hydrocarbon	mg/L	Not Detected	Not Detected	Not Detected	Lead as Pb	mg/L	0.03	0.07	0.05	Arsenic as As	mg/L	BDL(MDL: 0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	Nickel as Ni	mg/L	0.04	0.37	0.13	Total Chromium as Cr	mg/L	0.01	0.06	0.04	Cadmium as Cd	mg/L	0.05	0.19	0.11	Mercury as Hg	mg/L	BDL(MDL: 0.001)	BDL(MDL:0.001)	BDL(MDL:0.001)	Zinc as Zn	mg/L	0.12	0.27	0.18	Copper as Cu	mg/L	0.07	0.07	0.07	Iron as Fe	mg/L	0.12	1.12	0.64	Insecticides/Pesticides	µg/L	Absent	Absent	Absent	Depth of Water Level from Ground Level	meter	1.90	2.30	2.11
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							<p>Approx. INR 15.32 Lakhs is spent by APSEZ for environmental monitoring activities during the FY 2022-23, which also includes ambient air quality monitoring for overall APSEZ, Mundra.</p> <p>The freshwater requirement of all the industries within SEZ is being satisfied through APSEZ. All the industries are encouraged to monitor ground water quality as per the permissions granted by competent authorities.</p> <p>As mentioned above, presently, APSEZ has formed Internal Environment Monitoring Committee, involving Officials of APSEZ, Adani Power Limited and other member units, having role and responsibilities as defined above.</p> <p>APSEZ will co-operate and comply with the directions from concerned regulatory authorities for ground water management.</p>
8	Waste Management						
8.1	Solid waste will be generated from industrial activities of APSEZ and other	Level-2	APSEZ has been adopting Zero waste Initiatives and the entire waste generated	APSEZ will continue to adopt Zero Waste Initiative and wastes will be segregated at source and disposed to	APSEZ	Continual Process	<p>Presently APSEZ has implemented Zero waste Initiatives as per 5R (Reduce, Reuse, Recycle, Recover & Reprocess) principles of waste management. At present, APSEZ has developed material recovery facility for 6.0 TPD capacities. A well-established system for segregation of dry & wet waste is in place. All wet waste (Organic waste) is being segregated & utilized for compost manufacturing and/or biogas</p>

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	permitted facilities in the study area including Mundra town. These wastes would contain recyclable material, construction debris, organic waste, inert material and e-waste etc. In the absence of any organized source segregation programs and material recycling strategies		from existing operations is segregated and disposed to recycling vendors, thereby APSEZ has achieved zero landfill status as on date.	various recycling vendors, co-processing in cement plants. This initiative helps not only to reduce the waste to landfill significantly, but also to recycle the materials there by avoiding ecological impacts.			<p>generation for cooking purpose. The compost is further used by in house horticulture team for greenbelt development. Whereas dry recyclable waste is being sorted in various categories. Presently manual sorting is being done for sorting of different types of solid waste. Segregated recyclable materials such as Paper, Plastic, Cardboard, PET Bottles, Glass etc. are then sent to respective recycling units, whereas remaining non-recyclable waste is bailed and sent to cement plants for Co-processing as RDF (Refused Derived Fuel). The same practice will be continued in future also. APSEZ has also been recognized for Zero Waste to Landfill certification from reputed organization.</p> <p>APSEZ, Mundra is certified for Zero Waste to Landfill management system (ZWTL MS 2020) by TUV Rheinland India Pvt. Ltd. (valid up to 31.05.2024). Details of the same were submitted as part of compliance report submission for the duration of Apr'21 to Sep'21.</p> <p>APSEZ is being done proper solid waste management in his operational area with 5R principle as per Waste Management Plan.</p>

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	and infrastructure facilities, these wastes will enter into environment and would pose long term health impacts.						
8.2	Considering an average solid waste generation of 0.25 Kg/person/day, the estimated solid waste from facilities within APSEZ will be in the order of 100	Level-2	APSEZ has made a provision for central waste management facilities within the existing site based on the future needs. As part of the Zero Waste Initiatives, no landfill facilities will	The existing waste segregation and material recycling facilities will be augmented to dispose safely the wastes generated from APSEZ areas. Solid Waste Management Program shall be adopted and implemented as per Municipal	APSEZ	Continual Process	Industries located within the SEZ area are also complying with the waste management rules stipulated by statutory authorities and same is also being confirmed by APSEZ as well SPCB on regular basis.

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	TPD (36,500 TPA).		be installed at APSEZ.	Solid Waste Management Rules 2016 and Construction Waste Management Rules 2016			
8.3	About 35 TPD (13,000 TPA) of solid waste would be generated from the proposed industrial areas located outside the APSEZ area.	Level-2	As per the MSW Rules 2016 all the industrial facilities and SEZs are required to adopt waste segregation facilities at the respective properties and non-recyclable waste shall be disposed to landfill sites.	Solid Waste Management Program shall be adopted and implemented as per Municipal Solid Waste Management Rules 2016 and Construction Waste Management Rules 2016	All Industries	Continual Process	

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9	Ecological aspects (terrestrial and marine)						
9.1	About 1576 ha of shrub forest land contiguous to APSEZ area is applied for land diversion for various developmental activities. This might have certain level of changes in the biodiversity in the study area.	Level -1	It is noted that the designated forest land is free from any native vegetation and comprises of Prosopis juliflora. It is also noted that no endangered species are present at the shrub forests that are applied for land diversion. It is also noted that	APSEZ has approached concerned authorities for diversion of designated forest land. Suitable compensatory afforestation plan shall be adopted based on the recommendations and directions of the concerned authorities. Due to adoption of compensatory afforestation program through a scientific manner, the overall ecological footprint in the district will be increased.	APSEZ/State Forest Department*	Long Term	ToR accorded by MoEF&CC on 30.11.2021 Additional studies as a part of ToR compliance completed by GUIDE and final report received. Draft EIA is being prepared by NABET Accredited consultant L&T Infrastructure PVT LTD. Draft CRZ maps received from NCESS, Kerala and the same is under review.

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			no forest produce is reported from this designated forest land parcel due to lack of economic importance of plant species reported in the shrub forest. It is also noted that no tribal lands are located in the designated forest land parcel. Hence there will not be any change in	Due to plantation of native tree species as part of greenbelt development, the overall biodiversity of the region will increase considerably when the project is fully developed.			

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			biodiversity due to the proposed diversion.				
9.2	Mangrove conservation areas are located adjacent to the APSEZ area. Accidental discharges of industrial effluents into the marine environment would pose certain ecological risk.	Level -1	No development activities will be undertaken within mangrove conservation areas. APSEZ has taken up large scale mangrove afforestation activities in an area of more than 2800 ha at various locations across the coast of Gujarat state in	Mangrove footprint and health status shall be monitored annually	APSEZ	Continual Process	<p>As per study conducted by NCSCM in 2017, mangrove cover in and around APSEZ, Mundra has increased from 2094 Ha to 2340 ha (as compared between 2011 to 2017). The analysis has shown an overall growth of 246 ha. The cost for said study was INR 3.15 Cr.</p> <p>Recently study was carried out in the year 2019 and based on that there is an increase of mangrove cover between March 2017 (Total 2340) and September 2019 with an extent of 256 Ha (Total 2596 Ha Area) which is about 10.94% rise in growth rate, also It reveals that the mangrove and the tidal system in the creeks remained undisturbed over this period.</p> <p>Hence, there is an overall growth of mangroves in creeks in and around APSEZ, Mundra is 502 Ha between 2011 and 2019.</p> <p>Analysis of data between categories indicated that there was an increase in dense mangroves along with the conversion of scattered into sparse, that shows the growth of mangroves in a progressive direction.</p>

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			consultation with various organizations The Adani Foundation introduced 'Mangrove Nursery Development and Plantation' scheme in the area as an alternative income generating activity for the people of the region.				<div>As a part of GCZMA recommendations and NCSCM mangrove conservation action plan, APSEZ has undertaken following activities.</div> <table><tr><th>Sr. No.</th><th>Recommendations</th><th>Compliance</th></tr><tr><td>1.</td><td>Mangrove mapping and monitoring in and around APSEZ</td><td><ul style="list-style-type: none">APSEZ entrusted NCSCM, Chennai to carry out Monitoring of mangrove distribution in creeks in and around APSEZ and shoreline changes in Bocha island.As a part of this study, overall growth of mangroves in the creeks in and around APSEZ was assessed comparing Google earth images of 2017 & 2019 and it is observed that there was increase in mangrove cover between March 2017 and September</td></tr></table>	Sr. No.	Recommendations	Compliance	1.	Mangrove mapping and monitoring in and around APSEZ	<ul style="list-style-type: none">APSEZ entrusted NCSCM, Chennai to carry out Monitoring of mangrove distribution in creeks in and around APSEZ and shoreline changes in Bocha island.As a part of this study, overall growth of mangroves in the creeks in and around APSEZ was assessed comparing Google earth images of 2017 & 2019 and it is observed that there was increase in mangrove cover between March 2017 and September
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									<p>2019 to the extent of 256 Ha, which is about 10.7%.</p> <ul style="list-style-type: none"> This suggests that the mangroves and the tidal system in the creeks remain undisturbed over this period. Analysis of data between categories indicated that there was an increase in dense mangroves and also conversion of scattered to sparse which also shows that the growth of mangroves in a progressive direction. Hence, there is an overall growth of mangroves in creeks in and around APSEZ, Mundra is 502 Ha between 2011 and 2019. The cost of the said study was INR 23.56 Lacs incurred by APSEZ.

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							2.	Tidal observation in creeks in and around APSEZ	<ul style="list-style-type: none"> APSEZ carried out the tidal observations at locations similar to 2017 in Kotdi, Baradimata, Navinal, Bocha and Khari creeks under the guidance of NCSCM. The observed tidal ranges indicate that the creeks experience normal tidal ranges, adequate for the growth of mangroves. The cost of the said activity was INR 1.0 Lacs.
							3.	Removal of Algal and Prosopis growth from mangrove areas	<ul style="list-style-type: none"> Algal and Prosopis growth monitoring was done in and around mangrove area and algal encrustation was found in some of the mangrove areas, which has been removed manually. The cost of the said activity was INR 2.35 Lacs during the FY 2022-23. The details of algal &

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									prosopis removal is attached as Annexure - 8.
							4.	Awareness of mangroves importance in surrounding communities	<ul style="list-style-type: none"> Adani Foundation – CSR Arm of Adani group has done awareness camps/activities created in the community regarding importance of mangroves. Adani Foundation provides good Quality dry and green fodder to 24 Villages. Project is covering total 14116 Cattels / 3008 farmers and hence enhancing cattle productivity during last FY 2022-23. Awareness of mangroves importance in surrounding communities & Fodder support - The expenditure for fodder supporting activities was approx. 200.89 Lacs

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									<p>during FY 2022-23 which was incurred by APSEZ.</p> <ul style="list-style-type: none"> • Individual Fodder Cultivation: Farmers were Aware, Convince and trained to cultivate super Napier Grass as on farm projects to reduce their Fodder Dependency and expense. With that effort 192 farmers have Adopted and Cultivated Super NAPIER Grass in 190-acre area and produce 3800 Fodder Tons Yield annually, lead to save Approx Rs 52 Lacs of farmers. • Grass Land development: AF converted 205 acres of denuded village common pastureland gauchar into fertile and productive grassland in Zarpara and siracha village to transform into

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									<p>Fodder Sustain village with Community participation and responsibility for maintain and Monitoring.</p> <ul style="list-style-type: none"> • Among that 18 Acre of Guchar land is fenced and sowed with Multispecies Green Fodder with Having Good nutritive value More than 2250 Cattle will sustain with Improving quality and Quantity Of Milk.. • Other than this dedicated security guard with gate system deployed by APSEZ across the coastal area and no any unauthorized persons allowed within coastal as well as mangrove areas. • APSEZ has celebrated the International Day for the Conservation of the

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									<p>Mangrove Ecosystem on July 26th to raise awareness of the importance of mangrove ecosystems as "a unique, special and vulnerable ecosystem". The photographs of celebration were submitted in previous compliance period Apr'22 to Sep'22.</p> <ul style="list-style-type: none">Refer CSR report attached as Annexure - 2.
							<p>To comply with the GCZMA recommendations regarding mangrove monitoring at every 2 years, APSEZ earlier awarded work order to NCSCM, Chennai vide order no. 4802018994, dated 29/07/2022 with cost 23.77 Lacs for mangrove mapping in and around APSEZ, but due to some financial disputes and no proper response from NCSCM side regarding resolution, the work order has been revoked.</p> <p>After that as suggested by Joint Review Committee in its report that mangrove related studies may be undertaken by different agencies on a rotation basis</p>		

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							<p>for a better review of the mangroves, APSEZ issued work order to the Gujarat Institute of Desert Ecology (GUIDE), Bhuj vide order no. 4802027981, dated 10/04/2023 for mangrove mapping in and around APSEZ, Mundra. The cost of said work is 23.60 Lacs (Including Taxes), which will be paid by APSEZ.</p> <p>Other than this Adani Foundation – CSR Arm of Adani Group at Mundra-Kutch has initiated multi-species plantation of mangroves in Luni village in association with GUIDE, Gujarat. During 2018-2019 (Phase-I) multi-species mangrove plantation was carried out in 10 ha, during Phase-II (2019-2020) it was 02 ha and during Phase III (2020-2021) it is 01 ha. During FY 2021-22, 03 ha area coastal stretches have been planted with species. During current FY 2022-23, 04 Hectar plantation has been planted with various species. Total 20 Ha. multi-species mangrove plantation has been carried out till March-23 association with M/s. GUIDE,</p> <p>Mangrove plantation done at Luni sea coast with fisher folk community during World Environment Day Celebration. Web talk show was organized on the occasion of "World Mangrove days On Multi species Mangrove bio diversity with Joint effort of GUIDE and Adani Foundation, Mundra. 8th June is celebrated as world ocean day. Adani foundation had celebrated the world ocean day by coastal cleaning activity at Juna Bandar, Luni Bandar and Bavadi Bandar.</p>

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							Mangroves nursery is developed in a Khari creek behind IOCL & 125000 Nos. of new saplings were planted in creek area by APSEZ.																						
9.3	Outfall from the thermal power plants desalination and CETP would pose certain level of impact on the marine environment.	Level-1	A detailed marine hydro-dynamic and dispersion modelling of the study area indicates that the background temperature and salinity at mangrove conservation area will not increase from the prevailing background levels as the outfalls are located far away. APSEZ and	All approved marine outfalls shall be monitored for salinity, temperature and other designated parameters as per consent to establish issued by GPCB. Existing marine environmental monitoring program shall be continued.	APSEZ and Concerned Industry	Continual Process	<p>Presently marine monitoring is being carried out by the Adani power plant at the marine outfall locations and reports are being submitted to the concerned authorities on regular basis.</p> <p>APSEZ is carrying out Marine monitoring once in a month at 9 locations in deep sea by NABL and MoEF&CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. The analysis reports of the same are being submitted to the concerned authorities on regular basis.</p> <p>Adani power plant is also doing marine water quality at 5 locations (2 locations at outfall location) in deep sea by NABL and MoEF&CC accredited agency namely M/s. Unistar Environment & Research Labs Pvt. Ltd. The analysis reports of the same are being submitted to the concerned authorities on regular basis. The summary of marine water quality is shown above.</p> <p>The comparison of marine water results between CIA and current monitoring data are as below.</p> <table><tr><th rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="2">Max</th><th colspan="2">Min</th></tr><tr><th>CIA</th><th>Present</th><th>CIA</th><th>Present</th></tr><tr><td>Temp.</td><td>°C</td><td>30.2</td><td>30</td><td>28</td><td>29</td></tr><tr><td>Salinity</td><td>ppt</td><td>41.8</td><td>36.6</td><td>34.9</td><td>35.2</td></tr></table>	Parameter	Unit	Max		Min		CIA	Present	CIA	Present	Temp.	°C	30.2	30	28	29	Salinity	ppt	41.8	36.6	34.9	35.2
Parameter	Unit	Max		Min																									
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Temp.	°C	30.2	30	28	29																								
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			respective power plants in the study area have been monitoring the marine water quality status on monthly basis for the stipulated environmental and ecological parameters.				As per above results, it can be seen that there is no major deviation in the concentration of parameters and thus indicates that impacts are insignificant.
9.4	Terrestrial Ecology: Study area doesn't have any notified national parks or ecological sanctuaries. Since the	Level-1	APSEZ has developed greenbelt in an area of 550ha as against the committed area of 430ha. A dedicated nursery is set up to promote	The compensatory afforestation area to be monitored annually to check the survival rate of the plantation.	APSEZ	Continual Process	APSEZ has developed its own "Dept. of Horticulture" which is taking measures/ steps for terrestrial plantation/greenbelt development. APSEZ, Individual SEZ Industries and Adani Power Plant has developed approx. 700 Ha. area as greenbelt within the APSEZ area including SEZ industries & Adani Power Plant. Dedicated horticulture department is maintaining and monitoring the terrestrial green belt development on regular basis to check the survival rate of plantation. Total expenditures of the horticulture dept. of APSEZ

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	area falls under dry deciduous shrubs. Due to scanty rains in the area, the overall natural green-cover/vegetation in the area is very small.		plantation. APSEZ have undertaken a plantation with about 9.6 Lakh fully grown trees.				during the FY 2022-23 within APSEZ is INR 956 lakhs.
10	Socio-economic aspects						
10.1	Population growth in the Mundra region was reported to be in the order of 85% during the past decade (2001-2011). Further expansion of the urban	Level-1	Dedicated townships are developed within APSEZ area with necessary community infrastructure such as hospital, school, recreational facilities,	The existing townships will be expanded to accommodate about 4lakh people when the project activity is fully developed.	APSEZ	As and When Required	APSEZ has developed two townships (Shantivan and Samudra) accommodating 2045 households and associated infrastructure facilities. Accommodation is made available for all interested employees working within Adani group & SEZ industries. Out of which 96.87% Occupancies are accommodated within the townships and rest are available for employees working within APSEZ. At present 54 nos. of industries (processing & non-processing) are operating within the SEZ. Township facilities are also made by SEZ industries within

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	area could be possible due to induced economic growth in the region. Increase in population will have a additional need for public infrastructure in the region.		sewage treatment and waste collection facilities. Adani Foundation has been undertaking various CSR programs under the principal themes such as education, community health, sustainable livelihood and rural infrastructure. About Rs. 97 Cr has been spent on various CSR activities in the Mundra region since 2010. Similar community				<p>Mundra town for their employees having basic infrastructure facilities and requirements. Most of the employees working in SEZ industries are residing in Mundra township having all basic requirements and associated facilities.</p> <p>The existing social infrastructure facilities are adequate to accommodate the people considering present APSEZ development. The existing townships with associated facilities will be expanded as per requirement. Other infrastructure facilities have been developed for people are as follows.</p> <ul style="list-style-type: none"> • Multi-Specialty Hospital • School • Commercial complex • Religious place <p>APSEZ is actively working with local community (including fishermen community) around the project area and provides required support for their livelihood and other concerns through the CSR arm – Adani Foundation in the main five persuasions is mentioned below.</p> <ul style="list-style-type: none"> • Community Health • Sustainability Livelihood – Fisher Folk • Education • Rural Infrastructures

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			development programs (based on need based assessment) will be continued in future as well with allocation of appropriate budget.				<p>Adani foundation has spent approx. INR 7574.54 lakhs from April – 2018 to March – 2023 for CSR activities which also includes cost of rural infrastructure projects.</p> <p>Major works carried out since April 2018 as a part of CSR activities are as below.</p> <p><u>Current FY 2022-23 infrastructure development activities:</u></p> <ul style="list-style-type: none"> • 40 RRWS structure have been completed • 208 Bore-well recharging activity is completed. • Percolation well Recharging work at Bhadiya & Mota Kandgra village. • Sluice gate Construction to Control Flood during Flooding at Khoydivadi Vistar Bhujpur. • Pond Beatification and Bund Strengthening at Bhujpur village. • Check dam gate valve construction at Bhujpur which controlled more than 350 MCFT water to go into sea and get recharged current year. • commissioning of Community Training Centre at Shekhadiya. • Two Pond Deepening at Zarpara under Amrut Sarovar Yojna. • Ground recharge activities (pond deepening work for 61 ponds) individually and 26 ponds under Sujlam Suflam Jal Abhiyan.

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							<ul style="list-style-type: none"> • Pond Pipeline work at Prasla Vistar Zarpara which increase recharge capacity more than 25% in 100 hector area. • JCB & Hitachi Machine Support for Pre-Monsoon activities. Repairing and Maintenance work of Approach at Luni, Bavdi and Navinal Fishermen Bandar. • 3 Re-strengthening of Approach Road. • Renovate Blood storage Lab CHC Mundra • Renovation Blood storage Lab CHC Mundra. • Constructed 2 nos. of CC Road of 700 mtr. • Constructed Community Training center Shekadiya. • Constructed 2 nos. Disable Widow Toilet Block • Installed R.O. Plant at Mokha with capacity 1000ltr /HR. • Constructed 4 nos. Common gathering Open Shed • Constructed 03 nos. of Water Tank at Luni Bandar. • Developed of Cricket Ground at Hatdi Village • Pond Deepening work at Vadala & Mota Bhadiya • Artificial recharge borewell in Borana, Mangara & Dhrub village. • Under Dignity of Drivers Project, Adani Foundation has constructed Resting Shed for Drivers entering in SEZ Premises. Total 50 beds are constructed, drinking water and sanitation plus recreational – TV Facilities. <p><u>Past years infrastructure development activities:</u></p>

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							<ul style="list-style-type: none"> • Construction of 45 Toilet block and proper bathing place for labours. • RO Plant – Samaghogha, Siracha village & Vallabh Vidyalaya at Mundra • Basic sanitation facility (18 Nos) at Balvadi, medical centre and retiring places at labour settlements • Ground recharge activities (pond deepening work for more than 56 ponds) individually and 26 ponds under Sujlam Suflam Jal Abhiyan were built leading to a significant increase in water table and higher returns to the farmers. • Roof Top Rainwater Harvesting 145 Nos which is having 10,000 litre storage which is sufficient for one year drinking water purpose for 5 people family. • Recharge Borewell 201 Nos which is best option to • Drip Irrigation 1158 Farmers (180 farmers are supported with 15% of amount of total cost for maximum 4.0 lac. during FY 2021-22) • Participatory Ground Water Management in ten villages with holistic approach for Kankavati Sandstone Aquifer Programme. • Bund construction on way of Nagmati River could save more than 575 MCFT water quantity which recharged in ground due to which bore well depth

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							<p>decreased by 50-100 Ft in Zarpara, Bhujpur and Navinal Vadi Vistar.</p> <ul style="list-style-type: none"> • Development of Prisha Park at Mundra. • Pond Bund strengthening at Zarpara Village • Approach Road Restoration at all Fisher folk vasahat. • Garden Development at Primary School Rampar village • Shed Development at Shukhpurvah Mundra • Under Gram Utthan Project, Adani Foundation is supporting home biogas to farmers to Uthhan Villages phase wise. till the date supported 225 home biogas in Dhrub, Zarpara and Navinal Villages. • Adani Foundation at Mundra-Kachchh has initiated multi-species plantation of mangroves in Kachchh in association with GUIDE. During 2018-2019 (Phase-I) multi-species mangrove plantation was carried out in 10 ha, during Phase-II (2019-2020) it was 02 ha and during Phase III (2020-2021) it is 01 ha. During FY 2021-22, 03 ha with M/s. GUIDE, Gujarat. Current year 4 Hecter plantation is in progress which will be resulted in 20 Hecter. • Sea Weed Culture - A pilot cultivation facility (5 KL tanks in 6 nos) for the farming of different economically important seaweeds in the tanks on the onshore has been established and commenced the cultivation trials with red sea weeds

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							<p>Kappaphycus alvarezii, Gracilaria dura and green sea weed Ulva. The initial trials have given very promising results and harvested 6-7 times the seeded material in a 40-45 days cultivation period.</p> <ul style="list-style-type: none"> • Development Approach Road Prasala vadi vistar Gogan Pachim at Zarpara. • Earthen bund Repairing work at Pond, Luni. • Pre-monsoon activity Approach repairing, Village Pond Lake strengthen, and river cleaning (babul cutting) work is ongoing in Various Villages • Approach Road repairing at Various Fishermen Vasahat (ARC). <p>Similar community development programs (based on need based assessment) will be continued in future as well with allocation of appropriate budget.</p>
10.2	The overall sex ratio was found to reduce by 28% in the Mundra taluk (study area) during the period 2001 - 2011. This could be attributed to increase in	Level-2	Adani foundation is taking up several girl child education programs as part of CSR activities to create awareness	Suitable regional level awareness programs on the girl child protection and encouragement programs in line with state and national policies shall be adopted under Corporate Social Responsibility	APSEZ, Other development projects and District Administration*	Long Term	<p>Major works carried out since April 2018 as a part of CSR activities to create awareness about girl child protection are as below.</p> <ul style="list-style-type: none"> • The Adani Foundation provided scholarship support to motivation and encouragement of fishermen boys and girls for higher education under this program. APSEZ provide 100% fees support to girls as a scholarship. • Under Projects Uthhan More than 9106 Students are Getting benefit Of Education through 51 Government school Of Mundra Block.

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	influx of working men in the region due to rapid economic development. Similar trend might continue in future due to induced economic growth in the region.		about girl child protection.	programs in association with district authorities.			<ul style="list-style-type: none"> • Uthhan Project promotes girl child education, creating awareness through various Govt schemes i.e. Vahali Dikri Yojana, Sukanya Samriddhi Yojana etc. till date covered more than 1200 girl child to get benefit out of it. • AVMB School Bhadreswar where Free of Cost education is provide to Poor and Needy Family Child up to 10 standards More than 500 Students are benefiting every year. • Separate sanitation facilities for girl child in schools. • Beti Vadhavo Programme was organized in 32 Villages in the presence of Village Sarpanch and other leaders in year 2017-18. We explained people about the various topics i.e. importance of girl child, Sex Ratio, Gender Equality and laws regarding Child abortion. This initiative was well accepted by community and we have observed a visible change in their mindset. We have facilitated 560 daughters with Kit (Small Bed sheet, Mosquito net, Soap and Cream with nutritious food for mother) To create awareness about health, personal hygiene, child education and nutritional diet in fishermen community, various awareness programs have been organized. • During the year various activity like, Covid-19 awareness in village & Slum Area, Menstrual Hygiene Day, Breastfeeding Week, National

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							<p>Deworming Day, National Nutrition Month had been celebrated.</p> <ul style="list-style-type: none"> • Project Suposhan is initiated with the Motive to focus on adolescent and Reproductive age women nutrition part. Till date covered more than 12500 women and 8700 adolescents under this Project and brought them to considerable status. Curb malnutrition amongst Children, Adolescent girls and Women in our CSR villages. <ul style="list-style-type: none"> ✓ 100 beneficiaries covered in Menstrual Hygiene Day - with slogan called "RED-ACHHA HAI" ✓ 204 beneficiaries covered in Breastfeeding Week ✓ 320 beneficiaries covered in National Deworming Day ✓ 20 villages covered in celebration of NATIONAL NUTRITION MONTH ✓ 42 FAMILY COUNSELLING ✓ 2059 Women participated in celebration of Women's Day week. • To reduce malnutrition and anemia amongst Children 95 % & adolescent girls and pregnant & lactating women by 70 % in three years • Reduction IMR and MMR • Support Awareness & Cover 100 % Vaccination taken by Child & women. • SuPoshan Thanksgiving program was organized. In this webinar DDO, CDPO Mundra and other

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							<p>dignitaries remained present and appreciated the efforts to overcome malnourishment in Mundra and Bitta.</p> <ul style="list-style-type: none"> The National girl child day was celebrated with ICDC Department with Vahli Dikri Yojna form filling, paediatric health camp and Baby health kit distribution at Mundra. Mrs. Ashaben-CDPO Mundra was remain present in this event. Total 61 forms has received approval letter from GOG and 15 forms filled upon the same day. Adani Foundation is working with 15 Self-help group and supporting to develop entrepreneur skills to become self reliant, sourcing more than 350 women to absorb in various job –this will give them identity, confidence and right to speak in any decision for home, village and working area. <p>About INR 7574.54 lakhs has been spent on various CSR activities in the Mundra region since April 2018 to till March 2023 including cost of community health and education for woman and girl child.</p>
10.4	Due to economic growth leading to rapid urbanization, which prompts the	Level-2	Adani hospitals, Mundra is setup by Adani group near Samudra township with a goal to provide	APSEZ will explore other possibilities to augment the primary and secondary healthcare facilities in future depending on the growth scenario at	APSEZ	Long Term	<p>Adani hospitals (Multi-specialty), Mundra is having 110 bed facility and same is setup by Adani group near Samudra township.</p> <p>Primary health center and community health center are in place within the Mundra taluka.</p>

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	need for healthcare facilities in the region. For an influx of 6 lakh people from APSEZ operations and additional 3 Lakh from induced growth by the year by 2030 (fully developed scenario), total hospitals facilities with about 540 beds would be required.		primary and secondary health care services to Adani group employees and the local populace of Mundra. The existing 100 bed Adani hospital at Mundra has been catering the services ranging from wellness and preventative care.	APSEZ development.			<p>Other than this Adani foundation is doing various activities as part of community health. The details of last year are as below.</p> <ul style="list-style-type: none"> • Mobile Health Care Units and Rural Clinics • 09 Rural Clinics • 06 villages of Mundra, 02 villages of Anjar & 01 village Mandvi block has benefited by rural clinic service. • Total Patients Benefitted FY 22-23:- 25088 (direct & indirect). • 5 financially challenged patients has been supported with Dialysis treatment at 97 Times which added day in their Life. <p>Health camp:</p> <ul style="list-style-type: none"> • Specialty camps, Eye checkup camps, Blood donation camp, Anti-tobacco awareness camp, TB screening, and other are conducted in core villages as well as in labour colonies. • Specialty health (Gynec , Pediatric eye specialty health camp) :- 1527 Patients. • General health camp :- 3379 Patients Awareness Session • Cattle health camp: Total 17299 cattle of 19 Villages had benefitted with different kind of medicines and vaccines.

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							<ul style="list-style-type: none"> • Women's Health: Provided health services to over 1150 women through 102 + Menstrual Hygiene workshops. • Dialysis Support: During this year, 4 patients were supported for regular dialysis (twice a week) with partial support • Total 590800 CC quantity of Blood had been donated by 1710 Employees. • Medical Supports: 2460 beneficiary in 63 village. • TB screening & Awareness session: benefited 1795. • 25 villages and 07 fishermen settlements covered, with 90 types of general and lifesaving medicines through Mobile healthcare unit • 1491 –Economically Challenged patients have been supported for operation, OPD, IPD, Medicines and lab-test. • For Preventive health care General and multispecialty camps Pediatric camp, General Health camps in 9 villages and Super specialist camp which benefitted more than 4906 patients of Mundra Taluka. • Cattle Health Camp: Adani Foundation and Animal Husbandry department Veterinary Jointly organizing cattle health Awareness and vaccination programs in 24 Villages of our periphery villages. Total 17299 cattle of 19 Villages had benefitted with different kind of medicines and vaccines.

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							<ul style="list-style-type: none"> Lumpy Disease Vaccination Drive: Total 40 000 cattle were covered through therapeutic and ayurvedic treatment and Nutritive Cattle feed Support with association District Animal Husbandry department through vaccination and awareness drive. Present Hospital facilities are adequate to avail the medical treatment for Mundra region considering present development. Other Occupational Health centres, primary health centres and community health centres are also in place in Mundra to take care the people residing in Mundra. Adani group is also operating high quality health care services to the people of Kutch at G. K. General Hospital, Bhuj having 750 beds facilities on public private partnership (PPP) model, which is 60 km far from Mundra. <p>APSEZ will explore other possibilities to augment the primary and secondary healthcare facilities in future depending on the future development at APSEZ.</p>
	Due to rapid economic development in the region, several employment opportunities can be		APSEZ has been giving preferences to people from Gujarat for providing employment opportunities	APSEZ is committed to provide support for fishermen livelihood	APSEZ	Short Term	<p><u>Current FY 2022-23 fishermen livelihood activities development activities:</u></p> <ul style="list-style-type: none"> Government scheme Awareness session was held in association with Fisheries department Bhuj to facilitate pagadiya fishermen by providing fishing kits to seven Fishermen. The coordination was made by Adani Foundation to process application.

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10.5	<p>generated to the local people.</p> <p>When the area is fully developed by the end of 2030, the working population of the Mundra taluk would increase from current level of 55,000 to as high as 4,00,000, which will be 45% of the total envisaged population in Mundra Taluk by the end of 2030.</p>		<p>based on eligibility and skills. In Mundra, special programmes have been conducted by Adani Foundation to enhance the employability of youth from fisherfolk communities. Based on the need assessment results, several livelihood options have been introduced by the Adani Skill Development Centre, Mundra. In these centres, youth can join and get</p>	<p>activities and has submitted a detailed 5 years plan to MoEF&CC with a total budget of Rs.13.5 Cr.</p>			<ul style="list-style-type: none"> Mangrove plantation and Nursery development work has created a two facet impact by providing Livelihood to Fisherfolk during two months Fishing during Off season and developing 162 hector dense mangrove afforestation. 5200 Men days work provide to 285 Fisherfolk of Luni, Sekhdiya and Bhadreswar Villages in coordination with Horticulture Det. Formed Sagar Saheli SHG of Navinal Fisherfolk Women and Linked with DRDA after completion of Stitching Training, received first order of Rs 80 000 to prepare Cotton Bags. Total 12 Women are engaged and planning to expand with more Women and Order. During FY2022-23 Approx. INR 185.37 lakh were spent for Fisherfolk Amenities work in different core areas. Till FY 2022-23, Adani Foundation has done total expenditure of INR 1338.19 lakh for Fisherfolk Amenities work in different core areas. 507 underprivileged students of Fisherman & Maldhari communities underprivileged from 8 villages taking education at the Adani Vidya Mandir school. JCB & Hitachi Machine Support for Pre-Monsoon activities. Repairing and Maintenance work of Approach at Luni, Bavdi and Navinal Fishermen Bandar. Youth Employment: - Adani Foundation is committed for youth employment with imparting technical and Non-Technical Training for Fisherfolk Youth and started Electrical, Welder and Masson work training under Adani Skill Development Centre. Total 217 Fisherfolk are Employed and earning on Monthly Base. Average Monthly Income Rs.14500/ Individual.

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			vocational training for a number of technical and non-technical skills. An industrial Training Institute is set up at APSEZ, Mundra, to enhance the skill levels of the local youth to maximum possible extent.				<p>APSEZ is carrying out various initiatives specific to the Fisherfolk community which includes:</p> <ul style="list-style-type: none"> • Vidya Deep Yojana • Vidya Sahay Yojana – Scholarship Support • Adani Vidya Mandir • Fisherman Approach in SEZ • Machhimar Arogya Yojana • Machhimar Kaushalya Vardhan Yojana • Machhimar Sadhan Sahay Yojana • Machhimar Awas Yojana • Machhimar Shudhh Jal Yojana • Sughad Yojana • Machhimar Akshay kiran Yojana • Machhimar Suraksha Yojana • Machhimar Ajivika Uparjan Yojana • Bandar Svachhata Yojana <p>These initiatives are planned for the period 2016 – 2021 with a committed expense of INR 13.5 Cr as submitted earlier in detail in the report namely "Silent Transformation of Fisher folk at Mundra",</p> <p>Till, FY 2022-23 approx. 13.38 Cr. INR, has already been spent in support for fishermen livelihood activities. Further, details regarding the expenditure incurred against the commitment are attached as Annexure – 10.</p>

Annexure – 8

ALGAL REMOVAL WORK FROM MANGROVE AREAS

Creek area is regularly observed for checking algal encrustations. On the mangrove recruits & where the algal encrustation is found to be substantial, it is removed manually by deployment of required manpower. This operation is performed during the low tide conditions. The main object is to provide better growing condition for the growth of mangroves. Periodically, spread of *Prosopis* sp towards the mangrove areas is also observed as this species will compete with mangrove plants for growth.

Mangroves nursery is developed in a creek behind IOCL & 125,000 nos of new saplings are planted in creek area.

Reference photographs of activities undertaken as per given guidelines,

A) Plantation of Mangroves & removal of algal encrustations:



Annexure – 9

Final Report

Shoreline Change Assessment Studies Using Satellite Imageries at Adani Ports and SEZ Limited, Mundra

Submitted to: -

Adani Ports and Special Economic Zone Ltd (APSEZL),
Mundra, Kachchh District, Gujarat

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August 2022

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1. INTRODUCTION

The shoreline is the zone where large bodies like an ocean or lake meet the land. The coastal shoreline is a dynamic interface between the land and the sea water which gets altered due to various coastal processes that govern it such as wave characteristics, near-shore circulation, sediment characteristics, beach forms, etc. Shoreline changes are the result of a process called littoral transport, which is responsible for moving eroded materials along the coasts utilizing waves and currents in the nearshore zone (Misra and Ramakrishnan, 2015). The developmental and maintenance activities such as the construction of the port, mining of beach sand, industrialization, garbage dump, urbanization, recreational activities, discharge of domestic sewage and industrial effluent, and reduction in sediment supply from rivers have amplified the processes of modifications, including changes in the shoreline (Kannan and Malarvannan, 2016).

An important aspect of the shoreline is the sustainable development and protection of the coastal environment. Therefore, monitoring coastline areas is a crucial subject since shorelines are the most important and dynamic natural phenomenon (Tamassoki *et al.*, 2014), where changes in one part subsequently affect the other parts, which will be a chain of reactions.

1.1. Gujarat

Gujarat is situated on the western coast of India, in the Arabian Sea. Among the maritime states of India, Gujarat has the longest coastline of around 1650 km, which supports a wide diversity of marine flora and fauna. The state has two gulfs, the Gulf of Khambat and the Gulf of Kachchh, and the coast is differentiated between high rainfall area (2500 mm in south Gujarat) and low rainfall area (250 mm in the northwest part of Kachchh). The coast experiences a different range of tides, waves, cyclones, and currents in the sea, affecting the physical as well as the biological conditions of the whole marine ecosystem.



1.1.1. Gulf of Kachchh

The Gulf of Kachchh is situated along the west coast of Gujarat in India. It is about 170 Km in length. The coastal stretch of Kachchh district constitutes the entire northern coast of the Gulf of Kachchh (GoK) which is one of the three major Gulf systems of India endowed with very high biological richness and physical and chemical peculiarities. Despite its high aridity (4 on a scale of 1- 4) and poor mean rainfall (340 mm), the Kachchh coast has diverse ecological habitats and ecosystems like mangroves, sandy coasts, mudflats, creeks, and other tidal incursions which enhance manifold its coastal landscape diversity and natural resources.

In the late 1990s, industrial development was promoted aggressively because of its very rich mineral deposits, the short sea routes to Gulf countries, and easy availability of land which were considered best than the other coastal regions of the state. The announcement of tax holidays during the post-earthquake in 2001 by the state government provided further impetus for coastal industrial development. Many of these developments are beginning to have implications for ecological, social, and economic spheres. Kachchh coast faces threats from climate change, pollution, and habitat changes which are crucial for understanding the impacts on the shoreline.

Morphological change is responsible for the change in coastal structure or shape. Morphological change occurs due to tidal patterns. It can be estimated by different methods like Aerial photography, Field survey using GPS, Satellite remote sensing, LIDAR, etc.

The shoreline changes occurring due to processes like accumulation and erosion of substratum can be analysed in a Geographic Information System (GIS) by examining differences between the shoreline of different years. Shoreline proxies include the high-water line, vegetation line and dunes among many others. (Jodhani *et al.*, 2020)



1.2. About Adani Ports and Special Economic Zone Ltd. (APSEZL)

The former Gujarat Adani Port Ltd., now named as Adani Ports and Special Economic Zone Ltd. (APSEZL) started its operations in Mundra in 1998 with an all-weather, open-sea jetty and port backup at Navinal Island. The Port has since then undergone four expansions, namely a railway line and container terminal in 2000, Single Point Mooring and Pipeline for crude oil terminal in 2004, a Multipurpose wharf Terminal-II in 2007, and a Waterfront development project in 2009 which includes the development of North Port, South Port, East Port & West Port. In addition to these, port-based special economic zone and two thermal power plants exist which form a major industrial cluster of this coast.

1.3. Origin of the Study

APSEZ has obtained Environmental and CRZ Clearance for a waterfront development project at Mundra District, Kachchh, Gujarat, and as a part of EC/CRZ Clearance condition, APSEZ shall undertake “The shoreline changes in the area shall be monitored periodically and the reports to be submitted every 6 months to RO, Bhopal”.

Also, APSEZ had undertaken a Cumulative Impact Assessment (CIA) through NABET accredited consultant namely M/s. Chola MS Risk Services Limited, Chennai in the year 2015-16 in line with the MoEF&CC Order dated 18th September, 2015 for the projects already granted Environmental Clearance and CRZ Clearance in the region so that future developments can be assessed for providing necessary approvals at a later stage. As a part of the Environmental Management Plan (EMP) compliance with the CIA study, APSEZ shall undertake a study “To map the coastal morphology (Shoreline) at least once in three years”. Therefore, Adani Ports and Special Economic Zone Ltd. (APSEZL) has approached M/s. Gujarat Institute of Desert Ecology (GUIDE) to study the intensive monitoring of shoreline changes through high-resolution satellite imageries (LISS-IV). The present report compiles the results of shoreline change analysis by using satellite imageries and beach profile analysis of a 55 km coastline stretch of Adani Ports and Special Economic



Zone Ltd. (APSEZL). Due to the dynamic nature of shoreline boundary, it is essential to understand the long and short-term rate of shoreline changes from a coastal vulnerabilities point of view.

1.4. Objectives of the Study

1. To map and monitor shoreline behavior (changes) of 13 km (16 km on west side and 27 km on east side of Adani main port) coastline stretch of Adani Ports and Special Economic Zone Ltd. (APSEZL) using LISS-IV high-resolution satellite imageries during the years 2015 and 2022 after construction of port activities.
2. To identify the zones of high erosion and accretion using LISS-IV, high-resolution satellite imageries.
3. Collection of shoreline information and cross-sectional profiles using DGPS, at 20.00-meter interval along the route & offset between high tide line to low tide line, along the 10km stretch around the project site.
4. Shoreline change analysis by superimposing DGPS Survey data with satellite data.
5. Superimposing current shoreline changes data on approved CZMP in line with CRZ Notification, 2011 prepared by National Centre for Coastal Management (NCSCM).



2. STUDY AREA

2.1. Location

Kachchh coast constitutes the entire northern shore of the Gulf of Kachchh marked by narrow beaches and wide mudflats. The coastal stretch of the Mundra is dissected by extensive mudflats and creek systems. Major creek systems in the area are Navinal, Bocha, Baradi mata, and Kotadi creek. These creeks are again divided into minor creek complexes. The present study is about the shoreline changes on the coastal stretch of Mundra between the western side of Modhva to the eastern side of Luni which forms the study area (Fig.1.1) earmarked on the map.

The study site is 43 km long coastline stretch (16 km on the western side and 27 km on the eastern of Adani main port) of Adani Ports and Special Economic Zone Ltd. (APSEZL), located on the western coordinates of site $22^{\circ}47'37.289''\text{N}$, $69^{\circ}25'18.078''\text{E}$ to eastern coordinates of site $22^{\circ}50'56.604''\text{N}$, $69^{\circ}54'8.115''\text{E}$, which is given in Figure 2.1.

2.2. Climate

As per the Indian Meteorological Department, Govt. of India, the highest monthly mean of daily maximum temperature of the study area is 36°C . The dry bulb temperature goes up to 47.8°C , considering max Humidity of 95%. The wind is predominantly from the south-west as well as from the west to some extent. The wind velocity is 65 km/hr.

Due to its arid nature, annual rainfall in Kachchh is poor, ranging from 250-350 mm which is often irregular. However, the mean annual rainfall during 1932 to 2021 was higher at Mundra (478 mm) comparing to other coastal talukas of Kachchh district. Rain during monsoon is confined to only 12-16 days and occurs as an instant downpour. Freshwater input into the near coastal waters is quite meagre and appears to influence the coastal erosion. Annual temperature fluctuation in the district is extreme, ranging from $7-47^{\circ}\text{C}$ with a yearly average humidity of 60% which increases to 80% during the southwest monsoon and decreases to 50%



during November-December. The phenomenon of drought is common, with 2 drought years in a cycle of 5 years(Thivakaran *et al.*, 2015).

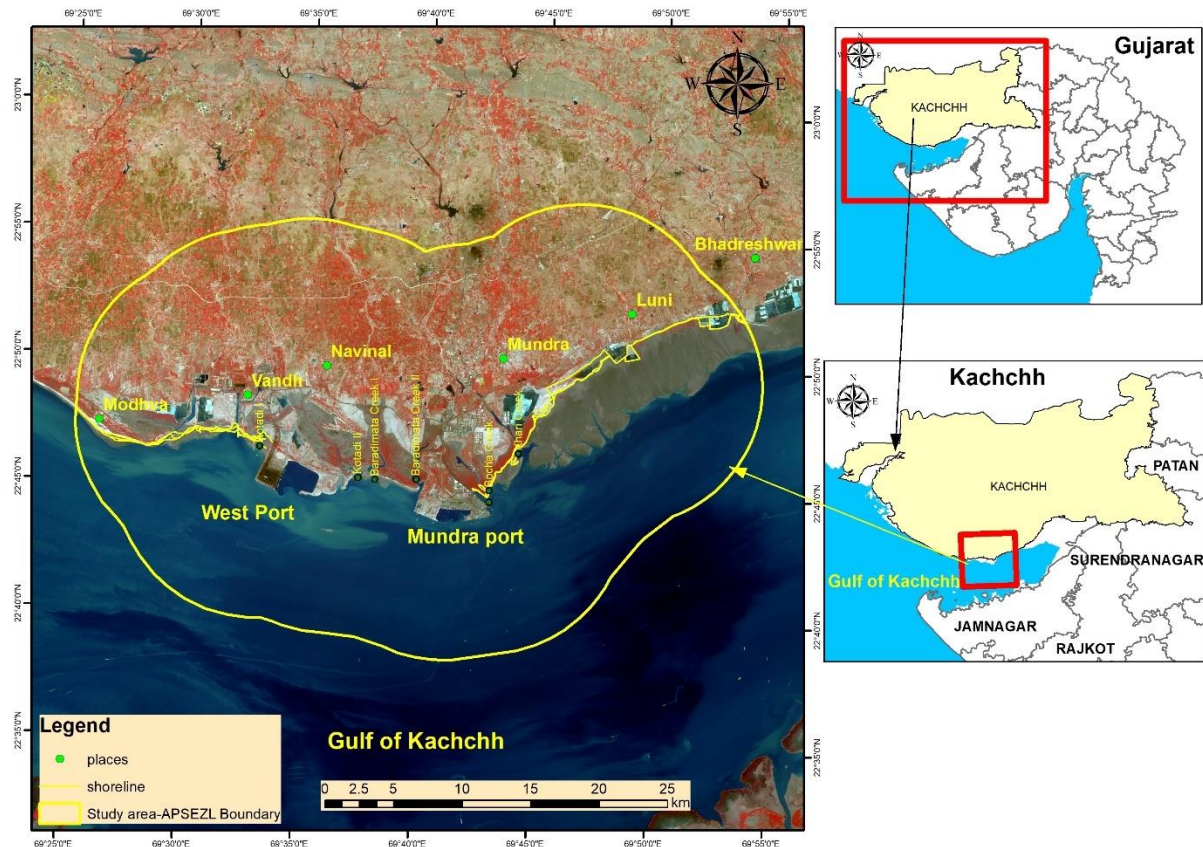


Figure 2.1: Location Map of The Study Area

2.2.1. Tidal Regime

Tides at Mundra are the mixed type, predominantly semidiurnal type with a Mean High-Water Spring (MHWS) of 6.66 m and Mean High water Neap (MHWN) of 5.17 m. The phase difference is not uniform for successive tides in the Gulf and it varies as per tidal conditions ((ICMAM 2004).

2.2.2. Currents

The currents in the Gulf and associated creeks are largely tide induced and oscillations are mostly bimodal reversing in direction with the change in the tidal phase. The influence of wind on variations in current is minor. The current reversals are quite sharp occurring within 30 - 60 min. The maximum current



speed varied from 0.5 to 1.2 m/s. The predominant direction of the current is 45° during flood and 220° during ebb.

The circulation is generally elliptical with the major axis in the east-west direction. These trajectories suggest that the excursion lengths are in the range of 10 to 15 km depending on the tidal phase (neap or spring)(NIO, 2009).

2.2.3. Salinity

Salinity is an indicator of freshwater intrusion in nearshore coastal waters as well as the excursion of salinity in inland water bodies such as estuaries, creeks, and bays. Normally seawater salinity is 35.5 ppt but may vary depending on evaporation, precipitation, and freshwater addition. Salinity largely influences several processes such as dissolution, dispersion, dilution, etc in seawater due to high dissolved salt content and high density. In the absence of freshwater inflow, the salinity varies from 35.9 to 38.0 ppt.



3. METHODOLOGY AND DATA USED

The shoreline change analysis has been carried out using multi-date satellite images to estimate the rate of change in terms of distance of the shore eroded or accreted using a cross-shore profile in terms of area and volume. From the satellite images, the shoreline has been extracted after rectification and co-registration. The rate of shoreline changes from 2015 to 2022 has been analysed and compared with the DGPS survey and ground truthing data for which Digital shoreline change analysis system (DSAS) software that works within the Geographic Information System (ArcGIS) software was applied. DSAS computes rate-of-change statistics for a time series of shoreline vector data. It is also useful for computing rates of change for other boundary change conditions that incorporate a clearly-identified feature position at discrete times (Himmelstoss *et al.*, 2018). The methodology flowchart of the present study on the shoreline change is shown in (Figure 3.1)

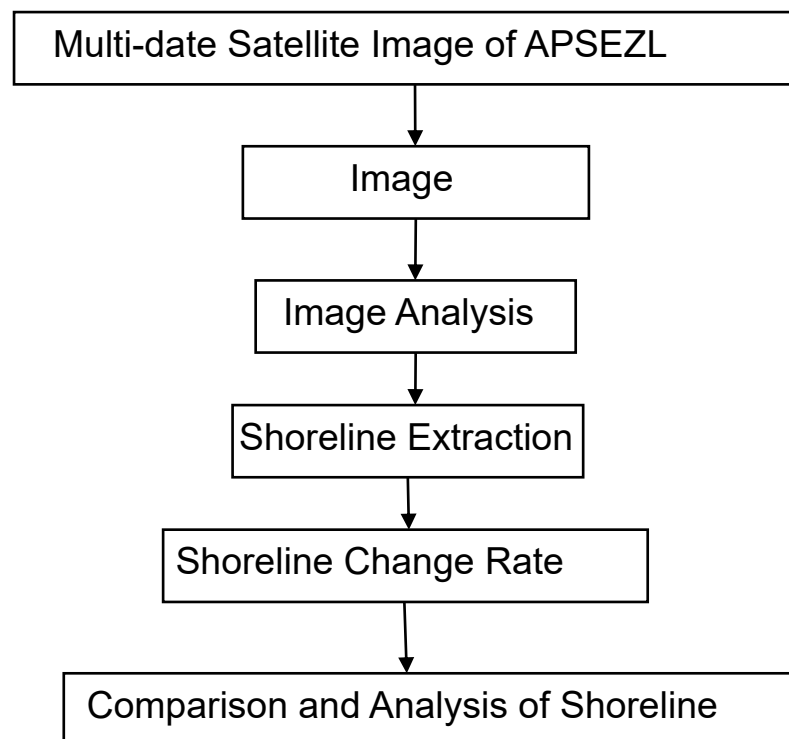


Figure 3.1: Flowchart of the Methodology Adopted



3.1. Short Term Shoreline Change Analysis

The end point rate (EPR) is calculated by dividing the distance of shoreline movement by the time elapsed between the oldest and the most recent shoreline (Figure 3.2). The major advantages of the EPR are the ease of computation and the minimal requirement of only two shoreline dates. The major disadvantage is that in cases where more data are available, the additional information is ignored.

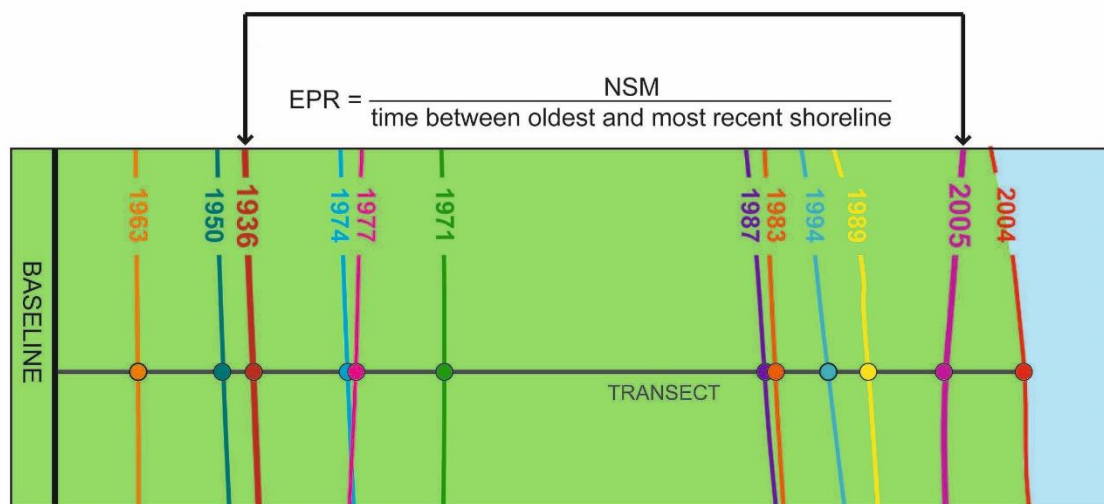


Figure 3.2: Calculation of Short-Term Shoreline change analysis

(Sample image source: (Sweet *et al.* 2017))

3.2. Long Term Shoreline Change Analysis

A linear regression rate-of-change (LRR) statistic is determined by fitting a least-squares regression line to all shoreline points for a particular transect (Figure 3.3). The regression line is placed so that the sum of the squared residuals (determined by squaring the offset distance of each data point from the regression line and adding the squared residuals together) is minimized. The linear regression rate is the slope of the line. However, the linear regression method is susceptible to outlier effects and also tends to underestimate the rate of change relative to other statistics (Sutikno *et al.*, 2017).

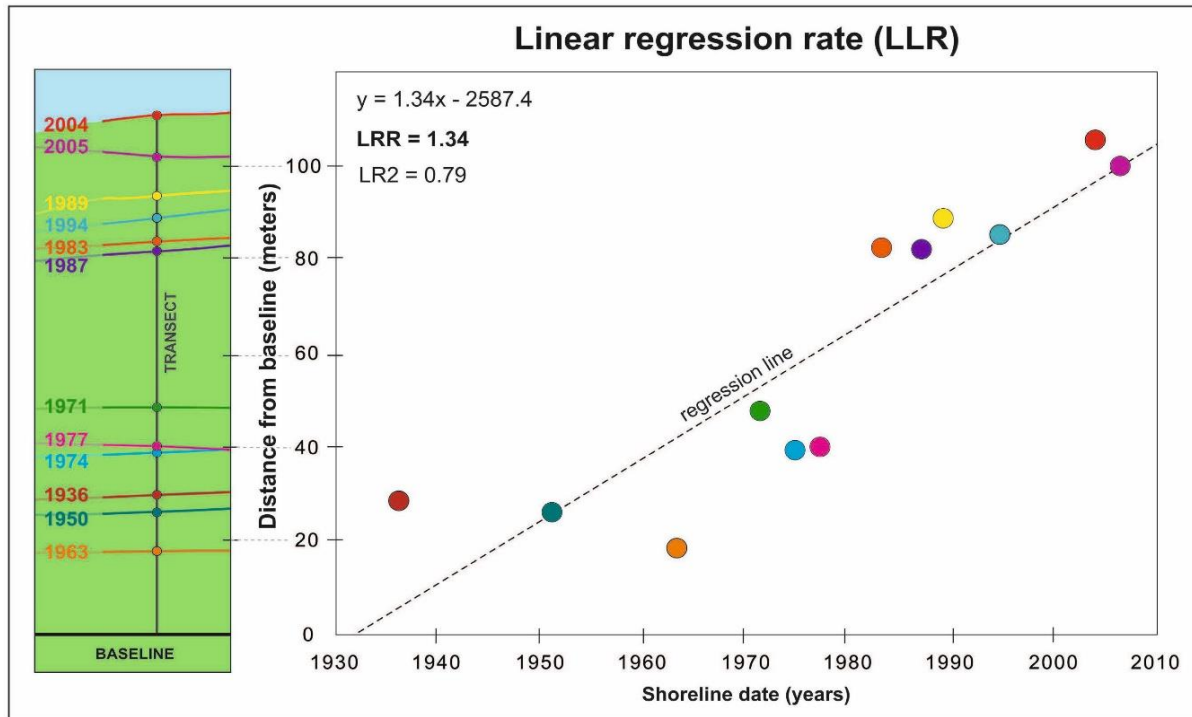


Figure 3.3: Calculation of Long Term (LRR) Shoreline Change Analysis

(Sample image source:(Sweet *et al.* 2017))

3.3. Data Used

The Multi-date satellite imageries, LISS-III and LISS-IV were procured from NRSC, Hyderabad was used for the analysis of the present study. The details of the satellite imagery used for the present study are given below (Figure 4.8, Figure 4.9 and Table 3.1).

Table 3.1: High-resolution Satellite Data for Shoreline Procured From NRSC

Satellite	Date	Sensor	Resolution (m)
IRS-R2	03 th March 2015	LISS-III	23.5
IRS-R2	12 th April 2022 and 24 th April 2022	LISS -IV	5.8

3.3.1. Pre-processing

Pre-processing of satellite data includes correction of geometric, atmospheric, and radiometric aspects and clipping of the area to obtain the exact imagery of the project sites. The rectification operation aims to correct distorted images to create



a more faithful representation of the original scene. It typically involves the initial processing of raw image data to correct geometric distortions.

Radiometric Correction: Radiometric correction addresses variations in the pixel intensities (DNs) that have not been caused by the object or scene scanned. These variations include differing sensitivities or malfunctioning of the detectors, topographic effects and atmospheric effects.

Geometric Correction: Geometric correction addresses errors in the relative positions of pixels. These errors are induced by sensor viewing geometry or terrain variations. A geometric correction was done based on Ground Control Points (GCPs) and the image was re-sampled using the nearest neighbourhood interpolation method.

Shoreline Extraction: Continuous shoreline positions were extracted automatically and digitized manually for two different periods i.e., 2015 and 2022. Digital Shoreline Analysis System (DSAS) version 5.1, an extension of ESRI ArcGIS software was used to calculate shoreline rate of change statistics from a time series of multiple shoreline positions. The shoreline positions were compiled in ArcGIS with 5 attribute fields that included Object ID (a unique number assigned to each transect), shape, shape length, ID, date (original survey year), and uncertainty values. All different shoreline features were then merged within a single line on the attribute table, which enabled the multiple coastline files to be appended together into a single shape file. The Shoreline change rate was calculated by Endpoint rate (EPR) for the short term and Linear Regression Rate (LRR) for the long-term period. DSAS is purely a statistical approach. A baseline was digitized onshore by closely digitizing the direction and shape of the outer shoreline, which was used as the starting point for all transects.



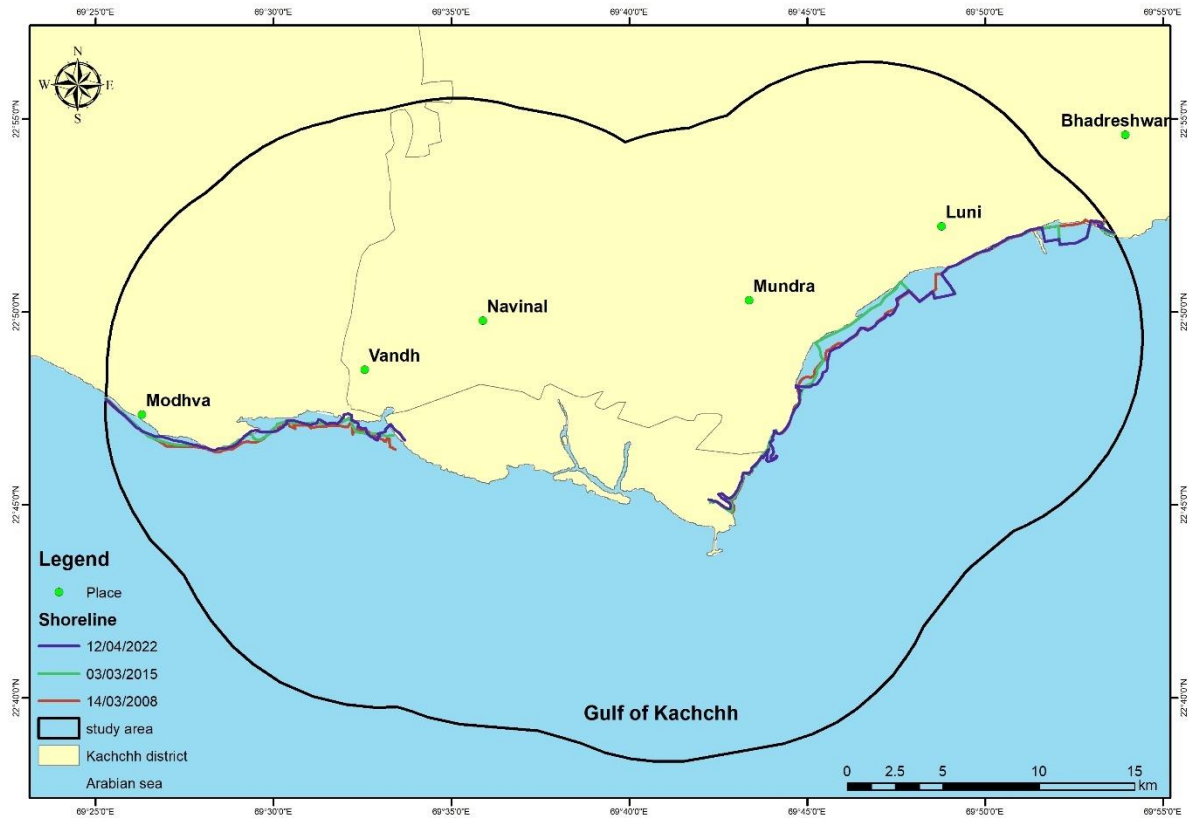


Figure 3.4: Shoreline Digitization for Different Years Using Multi Date Satellite Imageries.

3.4. Field Work

Field investigation is a vital part of the project. Fieldwork helps to check and collect most of the ground information required for shoreline mapping. The fieldwork was conducted during the period between 26th to 30th April 2022 and 21st to 23rd June 2022 for the DGPS survey and collecting ground truthing data.



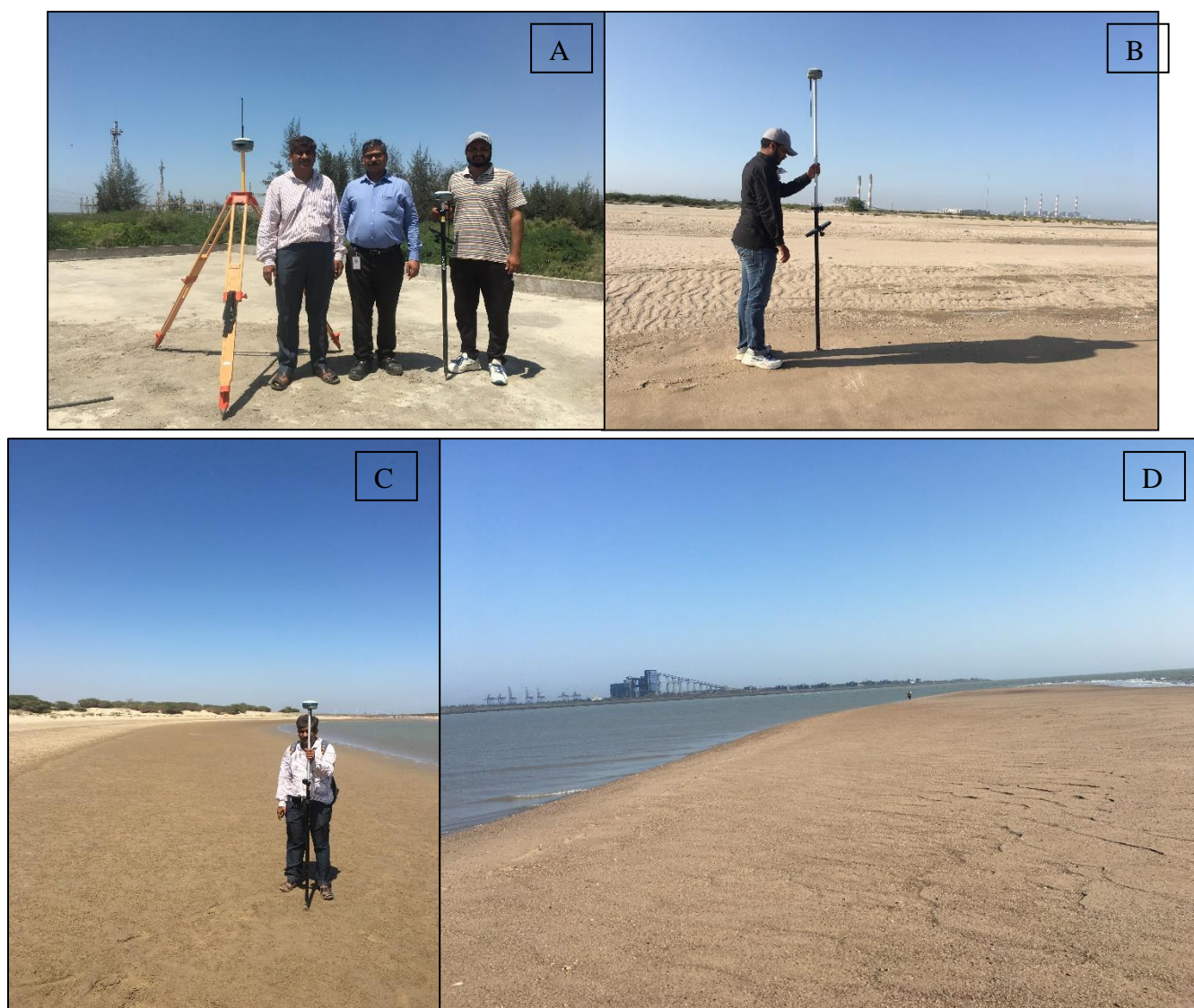


Figure 3.5: Establishing DGPS Base Station (A) And Collecting Survey and Ground Truthing Data(B), (C), (D) Using Rover.

4. RESULTS AND ANALYSIS

In the present study, the rate of shoreline changes statistics on a time series of multiple shoreline positions of a totally 43 km coastline stretches (16 km on the west side and 27 km on the east side of Adani main port) on either side of Adani Ports and Special Economic Zone Ltd (APSEZL) has been taken in to account for the calculation by using satellite images. A total of 4254 transects were generated with 10m spacing along the shoreline. The length of each transect (Cross shore) was between 500 to 3000m. The variations in the rate of shoreline change were re-coded as N – S coast configuration. The shoreline change analysis was carried out for 2015-2022, the short-term shoreline change analysis method EPR was carried out using medium resolution (LISS III) and high-resolution images such as LISS-IV.

As a part of the NGT direction, the shoreline change analysis has been carried out out for the years 2015-2022 to study the immediate changes after the commissioning of the port and initiation of the activities (September 2015) for short-term variation for the year 2015-2022 using EPR method has been carried out.

Based on the rate of change over the period, shoreline change has been categorized into seven classes National shoreline Assessment system (N-SAS, 2022). They are; high accretion ($>5\text{m/year}$), moderate accretion (3.0 to 5.0 m/year), low accretion (0.5 to 3.0 m/year), stable coast (0.5 to -0.5m/year), low accretion (-3.0 to -0.5 m/year), moderate erosion (-3.0 to -5 m/year) and high erosion ($>-5\text{m/year}$).

4.1. Results For Shoreline Change Analysis From Satellite Images

The erosion and accretion are highlighted with red and green colour respectively for better understanding. The study area is divided into two major blocks (1) West port and (2) Eastern side block for accurate analysis as shown in Figure 4.1.



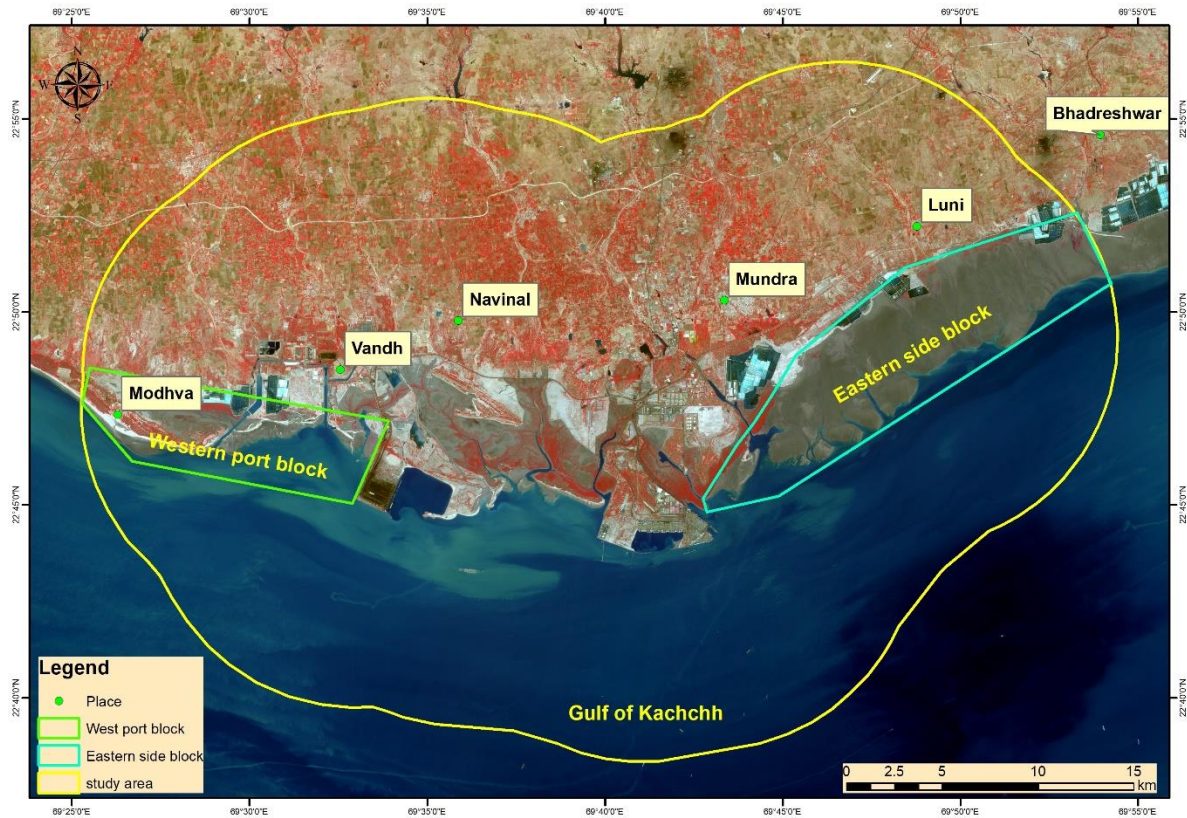


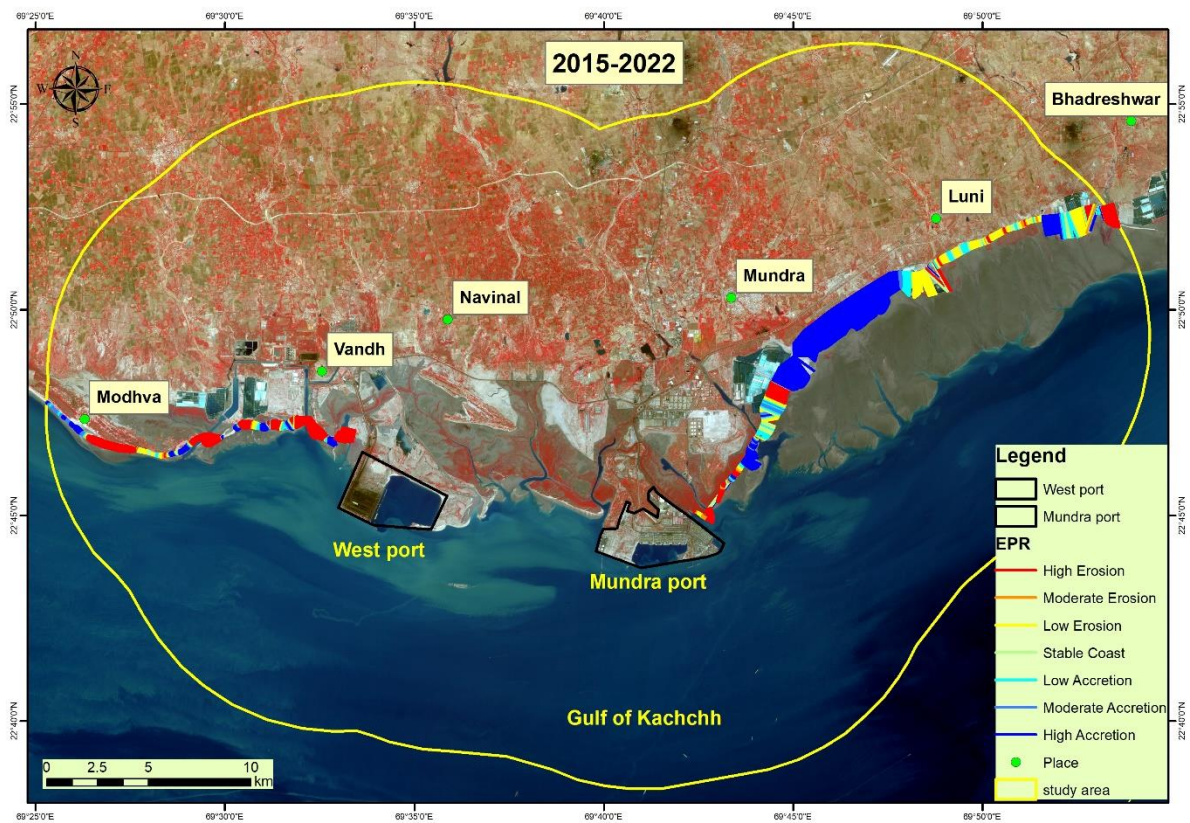
Figure 4.1: Study area in two blocks.

4.1.1. Results for Overall Shoreline Change From 2015 to 2022

The results of the imagery data analysed before the port activity using medium to high resolution of (LISS-III (23.5m) and LISS-IV (5.8m)) satellite images, processed for the period 2015 to 2022 have shown a high rate of accretion (5 to 191 m/year) to stable coast along the eastern side block except for a few pockets where there was low to moderate erosion on the shore has seen. In contrast on the western side of the port, most of the area are highly eroded (Figure 4.2) at has been observed. The details of the instantaneous rate of shoreline changes (Short interval time) recorded from 2015 to 2022 are summarised in Table 4.1. The data indicated that shoreline changes were very much dynamic and no regular pattern was evident at all in the study sites. However, the rate of change was comparatively high on the eastern side of the port during the last 7 years.

Table 4.1: Details of Average and Maximum Short term Shoreline Changes

Period	Name of the block	Average Shoreline Change(M/Year)	Shoreline Change(M)	
			Maximum Accretion	Maximum Erosion
2015-2022	West Port	-11.43	39.86	-78.68
	Eastern	-26.60	191.32	-165.19

**Figure 4.2: Shoreline Changes During March 2015 to April 2022**

4.1.2. Zones of High Erosion and High Accretion

For the present study on shoreline changes evaluation, one sets of data were considered. They are the moderate to high resolution (23.5m and 5.8m) images for 2015-2022 and overall shoreline changes delineate in high erosion and high accretion zone, and the results are presented in Figure 4.3.

Based on the analysis of the imageries it is possible to delineate the study areas into zones for the ease of classification into high erosion and high accretion within the study limits. The images have indicated that a total distance of 23.6 km showed



high accretion zone, around 1.9 km high erosion zone near Bocha island on the eastern side of Mundra port, however on the western side of west port 11 km identified as a zone of high erosion whereas approximately 5 km patches between west port to Modhva comes under the high accretion zones (Figure 4.3).

Shoreline change analysis for the present study has been carried out over 7 years ranging from 2015 to 2022. Change detection analysis of the study area indicated that the shoreline has undergone both accretion and erosion processes in the last 7 years. Transects demarcated for accretion and erosion rates indicate that almost 51.4% of the area has undergone accretion for the entire study period (2015 to 2022). Even though it was observed that 48.6% of the area had experienced erosion, the rate of removal of the substratum was relatively lower than the rate of accretion.

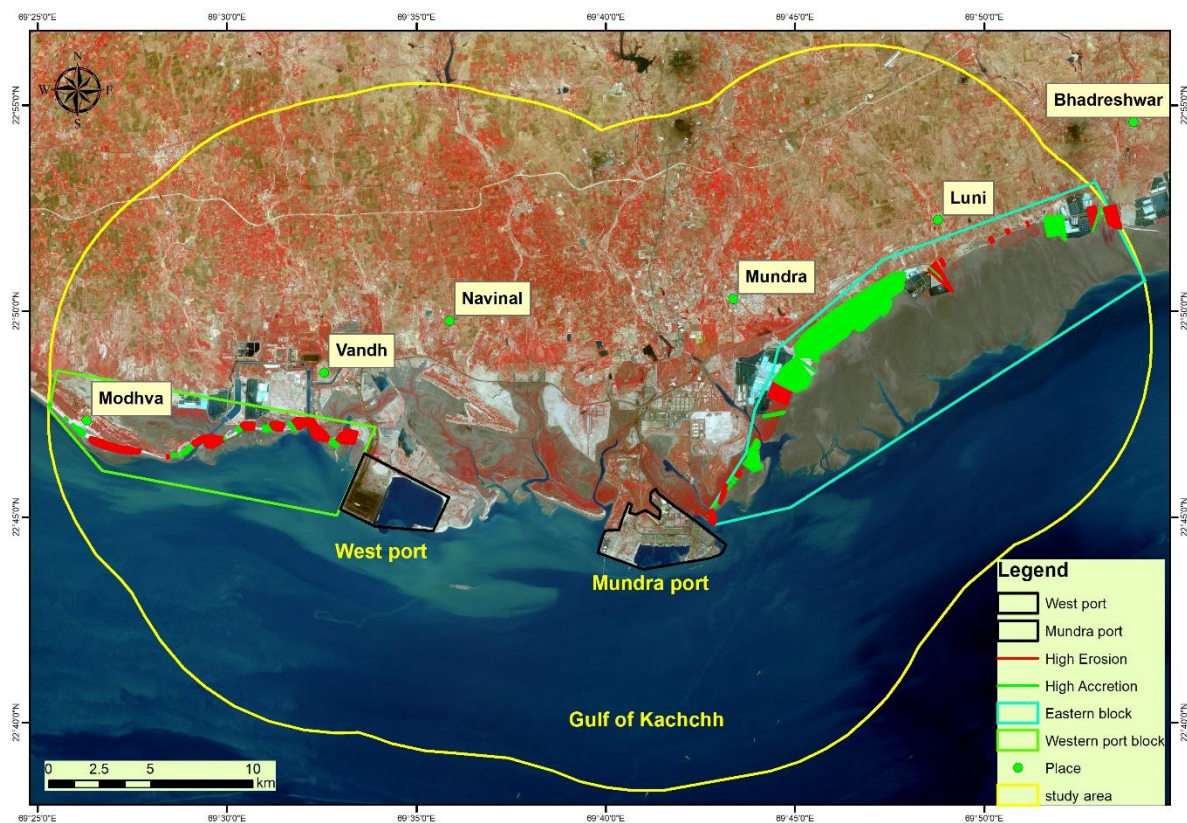


Figure 4.3: Zones of High Erosion and High Accretion

Validation of the shoreline data of the 43 km (16 km on west side and 27 km on east side of Adani main port) stretch of Adani Ports and Special Economic Zone Ltd

(APSEZL), using Differential GPS (DGPS) has been carried out for the period 26th to 30th April 2022 and 21st to 23rd June 2022 (Figure 4.4). The results obtained with the higher resolution satellite images of the field match the shoreline details derived from the satellite images.

The shoreline data derived from high-resolution satellite imagery obtained during 2018 has been compared with NCSCM (National Centre for Coastal Management) approved CRZ map (Figure 4.5) is quite similar to the shoreline configuration derived from the NCSCM (National Centre for Coastal Management) approved CRZ map of 2017-18.

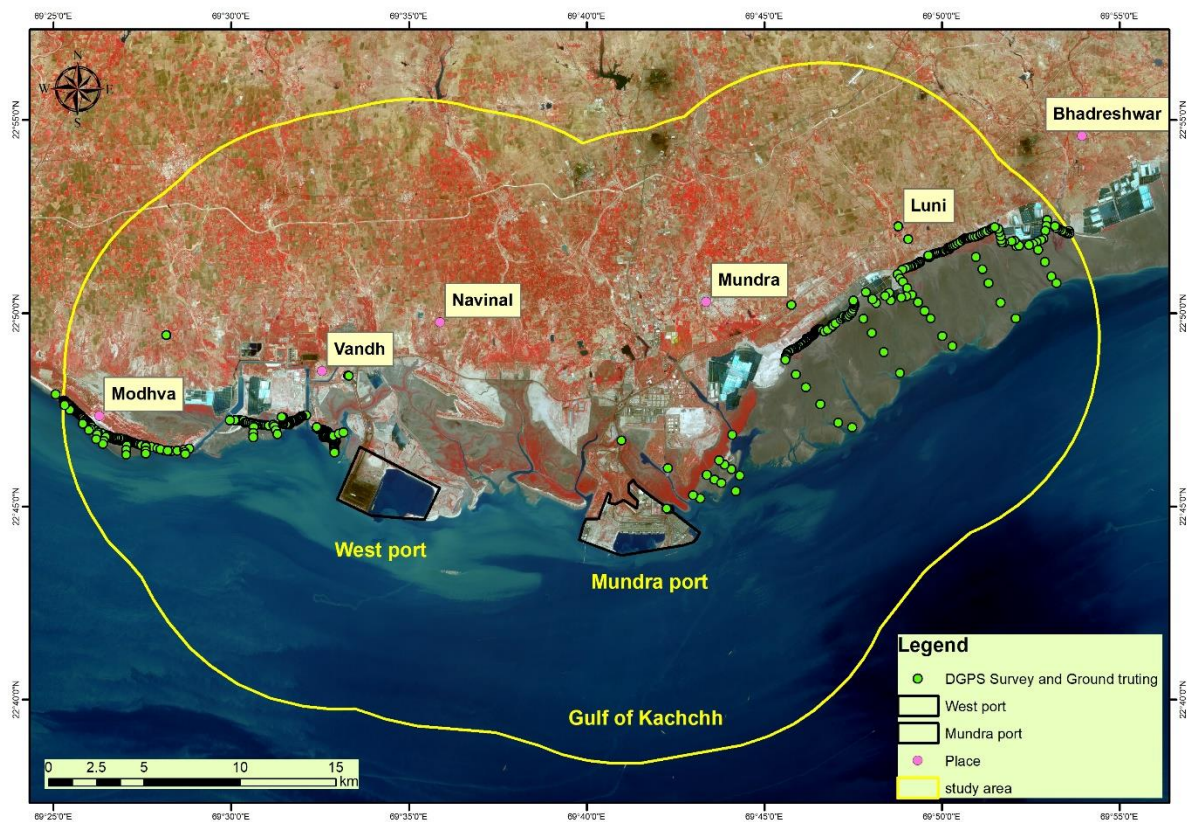


Figure 4.4: Shoreline Data of the Study Sites Using DGPS

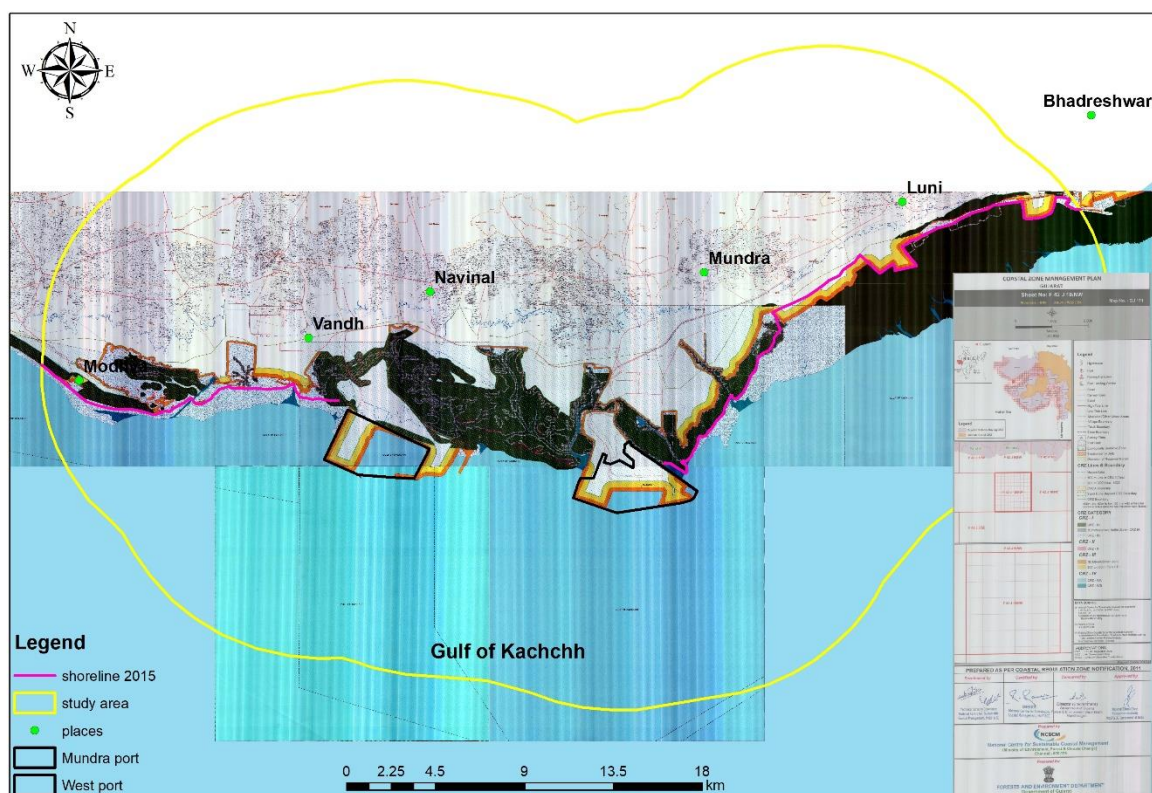


Figure 4.5: Approved CZMP in line with CRZ Notification, 2011 prepared by National Centre for Coastal Management (NCCM)

4.1.3. Beach Profile

Shoreline Change analysis using Cross Section Profile (CSP) has been carried out using DGPS Survey. CSP data has been collected from 20 different locations along the Mundra Coast. The total profile line stretches of 50 km covering the area of approximately 30 km west and 25 km east of the existing port site was conducted during the period 26th to 30th April 2022 and 21st to 23rd June 2022 (Figure 4.6).

This analysis was done to create a baseline data for comparison in the future with beach profile data from the same location for different seasons. Beach profiles were plotted location-wise. The trends of beach profiles were assessed qualitatively (Figure 4.6). The difference, if any, shall be investigated further to understand the impact due to port activities on the shoreline evolution.

A beach profile is defined as a set of beach levels taken at a uniform distance in a straight line (Figure 4.7). Beach profiles can only be meaningful if surveys are undertaken over a stipulated period at the same place and the same directions.

Further, the beach profile also suggests that there are regions of high-rate accretion and erosion on an average of 3.05 m (Figure 4.7), and also there are vertical changes as seen along the eastern of Mundra coast which could be the reason for the high rate of sediment deposition along the Luni and Bhadreswar coast in the recent times. The rate of shoreline changes may be also depended on the inflow of fresh water into the estuarine.



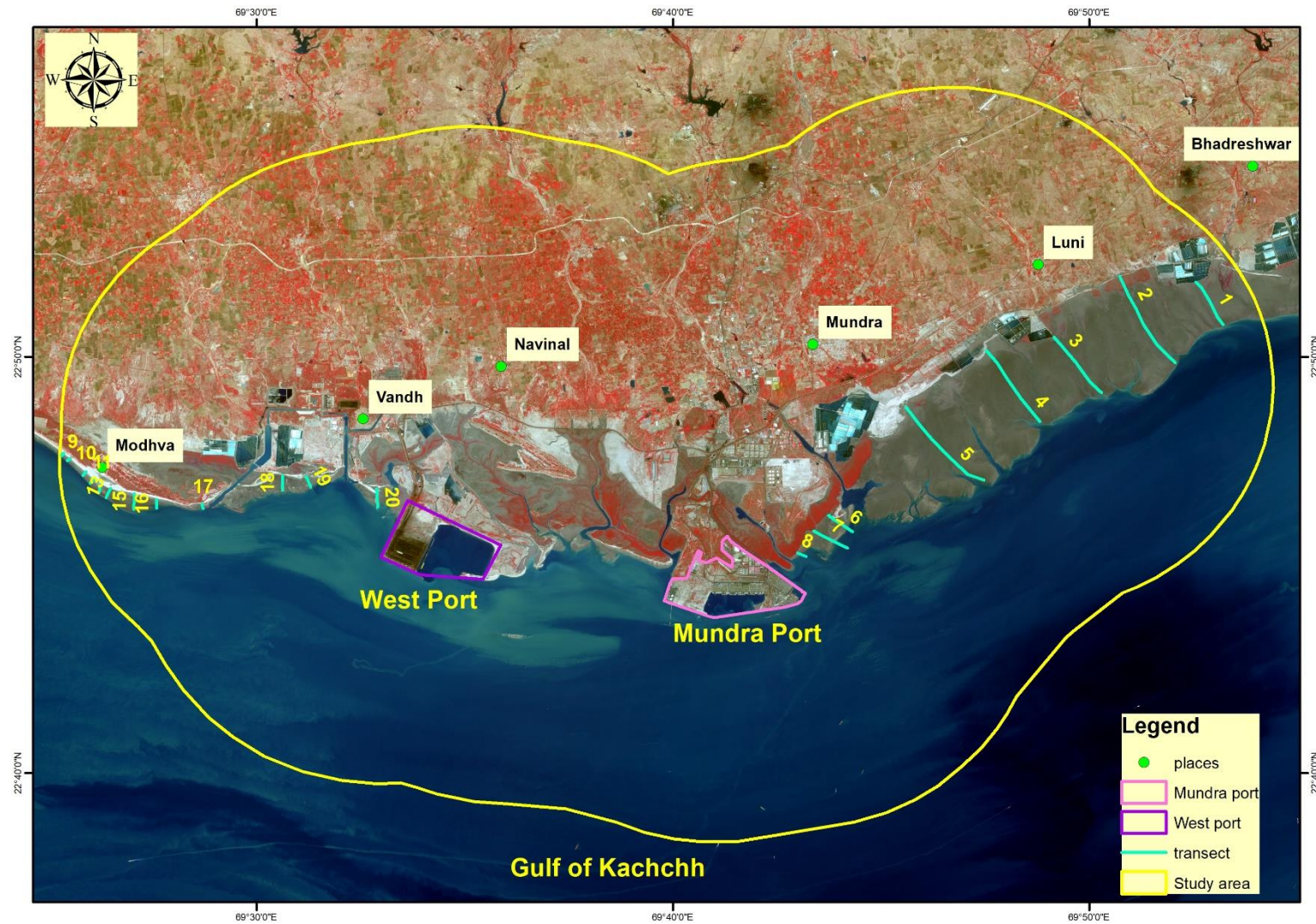


Figure 4.6: Beach Profile of the study area



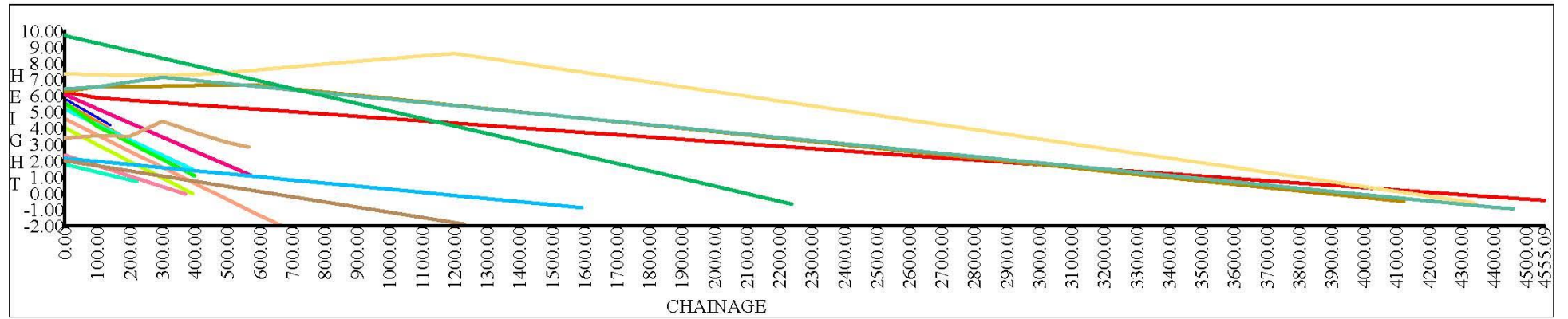


Figure 4.7: Beach Profile at Different Locations



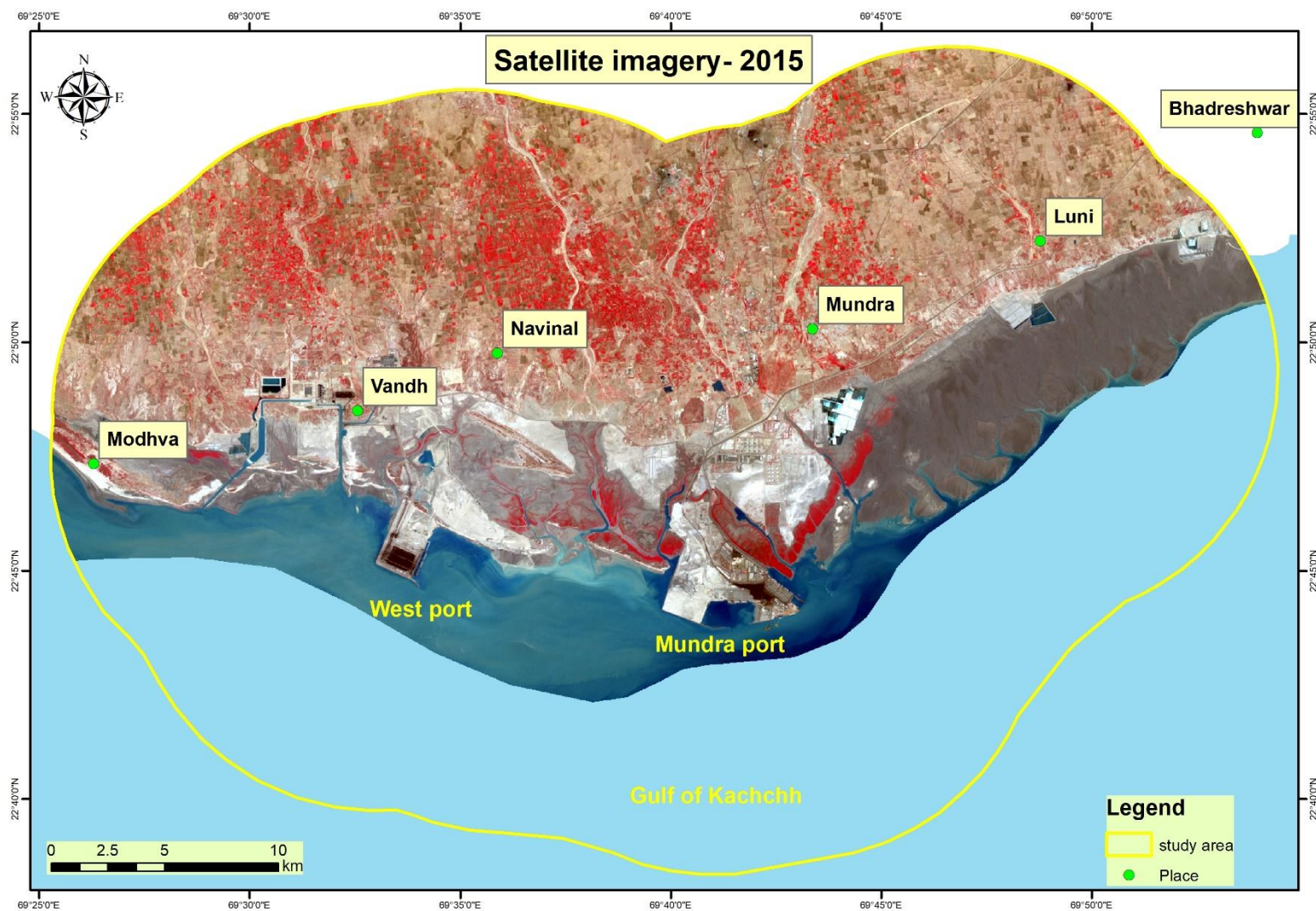


Figure 4.8: Satellite image of the Study area during May 2015



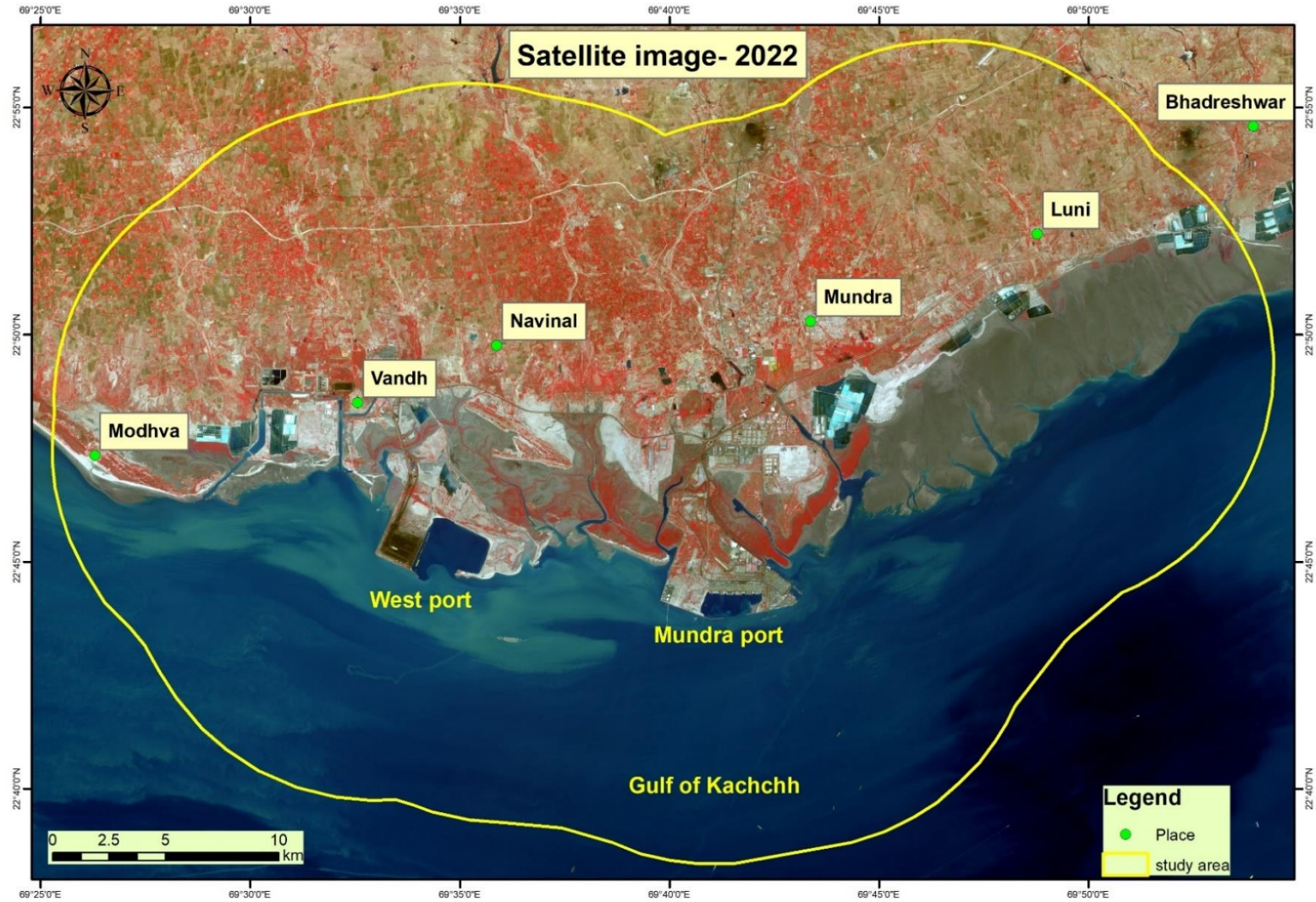


Figure 4.9: Satellite image of the Study area during May 2022



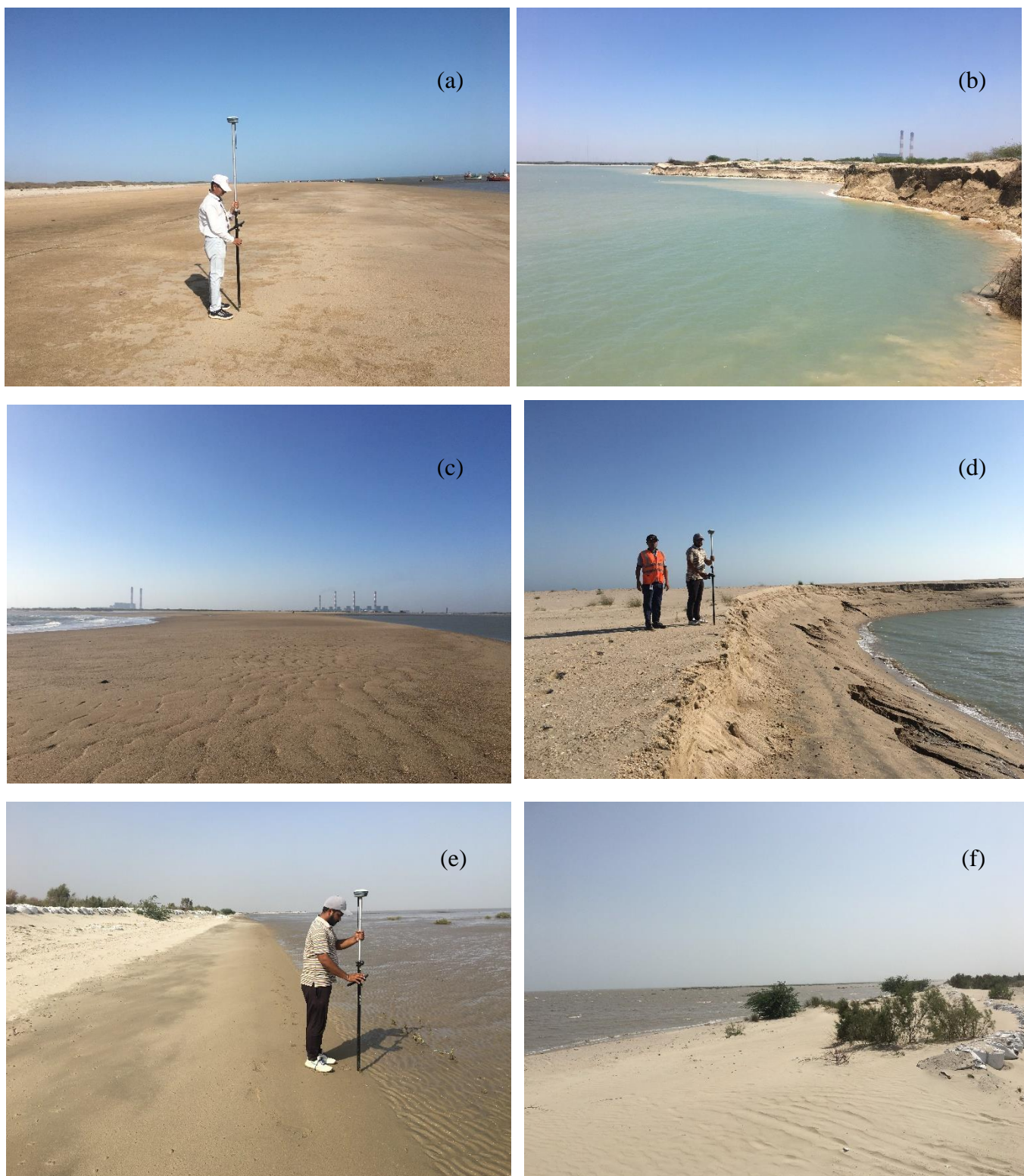


Figure 4.10: (a) Modhava Coast, (b) and (c) and (d) Western Coast (e) & (f) Eastern Coast of Adani Port.

5. CONCLUSION

5.1. Shoreline Changes

The present study confirms the expediency of the image processing techniques and GIS tools applied on multi-temporal and multi-spectral images of different satellite sensors for assessment of the changes along the shoreline. As deduced from the results of both short-term and long-term shoreline assessment that the results are in conformity with that of the data obtained through in-situ measurements, DGPS survey and ground truthing for the shore profile along the Mundra coast. The Mundra coast has been subjected to several significant changes during the last one and half decades (2015–2022) within this 43-km coastal strip particularly from Modhva (west) to Luni (east), ranging from high accretion of 191.32 m/year to severe erosion of up to -165.19 m/year, at few parts of the coast, however, remained stable. Above value for both erosion and accretion may vary $\pm 5\text{m}$ depending upon the time of the satellite imageries taken during high tide and low tide time.

The present study concludes that the shoreline at Mundra coastal region is under the impact of shoreline change with processes of accretion and erosion varying from time to time (Hitesh Patel, 2018). Process of erosion increased which includes some patches at Modhva coastal stretches, near the west port and some patches near mouth of Bocha Island on eastern side of Mundra port area whereas rest of the area observed accretion.

The predominant causes of shoreline changes are both natural as well as anthropogenic. Natural processes include wind and wave forces whereas man-made effects or artificial processes include the construction of marine structures and water control structures. It is revealed from the study that the setting of shorelines and the supply of sediments determines how the shoreline changes at a particular location (Jodhani *et. al.*, 2020). The conservation and management plan is indicated below:



5.2. Recommendations

- The process of erosion is highest along the edges (close to the waterfront) it could be controlled only by physical means by constructing appropriate civil engineering structures. Erosion control structures or constructing embankments of stones or any suitable material along the erosion site is strongly recommended if the problem is too heavy. The proposed embankment should be an eco-engineering design with a gentle slope of appropriate angle to the tidal action that will allow natural flushing while controlling erosion.
- Erosion, either man-made or natural is a major threat to intertidal habitats in the Gulf environment due to altered hydrological regimes and other natural causes. Observations carried out during the field surveys revealed those estuarine environments as well as many coastal stretches are facing erosion mainly due to high tidal amplitude. Hence, extensive surveys should be carried out to recommend suitable mitigation measures and to update the status of the biodiversity as well in order to estimate the level of physiographical impacts on the shoreline.
- Artificial coastal structures help in controlling coastal erosion and thereby enhance intertidal and sub-tidal biodiversity as they accelerate the reef-building process. Artificial reefs tend to last for decades supporting faunal components. Since such structures are built using natural materials (for example dead gastropods and bivalves) they are environment-friendly and in due course become natural. They attract diverse marine fauna within a short period with a high potential to enhance biodiversity. The same could be implemented in Adani Ports and Special Economic Zone Ltd (APSEZL) jurisdiction in consultation with the experts.
- Plantation of suitable saline tolerant plant species (shrubs and trees) also helps in controlling the soil erosion along the coastal area.
- The establishment of facilities and the expansion of infrastructure over the coming years will bring about notable changes in the landscape and seascape in and around the Adani Ports and Special Economic Zone Ltd (APSEZL). Long-



term human-centred/induced activity of this magnitude in any coastal belt will have repercussions on its natural resources and ecosystems. As mangroves, mudflats and tidal creeks are the major ecological entities within the Adani Ports and Special Economic Zone Ltd (APSEZL), their conservation and management warrants priority and calls for a holistic approach. Thus, measures should be taken to conserve and preserve the mudflats and mangroves within the Adani Ports and Special Economic Zone Ltd (APSEZL) to retain their tangible and intangible ecological benefits. The conservation and management plan presented in the proceeding section has the following broad aspects and different activities under each aspect are dealt with.

- The creation of baseline information to track subsequent changes in natural shoreline formation within the Adani Ports and Special Economic Zone Ltd (APSEZL) observations through GIS and RS tools have to be adopted. The GIS maps may be utilized for the purpose and could serve as a base map. Changes in creek systems, shoreline configuration and other land use categories could be monitored through this exercise once in two or three years.
- Periodical monitoring, preferably once in 3 years, and comparison of results with baseline data to underline changes will pave way for the formulation of mitigation and conservation efforts. Periodical monitoring of shoreline configuration and mudflats will help to assess their health and detect shoreline changes. Assessment and earlier generated data could be used to check shoreline configuration in terms of short and long-term changes and its succession patterns.
- Mudflats and mangrove conservation and restoration measures could subsequently be undertaken based on the results of the monitoring programs.
- Research needs to be undertaken to assess the economic and ecological benefits of sustainable development of shoreline configuration.
- Awareness should be generated among local people about the shoreline configuration changes in the surrounding areas and the consequences, particularly to the fishermen community.



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Annexure – 10

Expense Details for Fisherfolk Amenities work in different core areas										
Sr. No.	Details	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	TOTAL	AMT IN LACS
Expenditure Details (Amount in Rs.)										
1	Vidya Deep Yojana	2,069,300	193,000	2,087,000	1,771,000	110,225	580,103	969,660	7,780,288	77.80
2	Vidya Sahay Yojana	552,580	495,000	691,000	708,000	504,336	659,709	847,013	4,457,638	44.58
3	Adani Vidya Mandir – Shaping Lives	4,200,000	4,030,000	3,472,000	6,434,020	1,593,805	3,737,700	5,950,854	29,418,379	294.18
4	Senio Citizen Health Card	--	8,430,000	1,750,000	2,975,000	1,750,000	-	-	14,905,000	149.05
5	Financial Support to Poor Patients	4,439,507	1,275,000	813,000	1,296,063	763,800	1,255,000	1,691,410	11,533,780	115.34
6	Machhimar Kaushalya Vardhan Yojana	188,708	200,000	397,000	73,000	--	226,000	134,070	1,218,778	12.19
7	Machhimar Sadhan Sahay Yojana	--	--	315,000	522,000	--	-	-	837,000	8.37
8	Machhimar Awas Yojana	4,592,106	1,165,000	--	2,311,000	2,424,016	2,480,000	712,000	13,684,122	136.84
9	Machhimar Shudhh Jal Yojana	2,236,050	2,700,000	2,038,000	1,773,000	2,348,300	1,936,575	2,096,050	15,127,975	151.28
10	Sughad Yojana	1,367,300	170,000	--	192,000	30,000	-	-	1,759,300	17.59
11	Machhimar Akshay kiran Yojana	860,850	100,000	68,000	--	--	-	-	1,028,850	10.29
12	Machhimar Ajivika Uparjan Yojana-Mangroves plantation	1,558,800	500,000	1,382,000	1,400,000	1,900,272	2,069,432	1,914,432	10,724,936	107.25
13	Bandar Svachhata Yojana	106,400	50,000	--	--	367,000	145,000	25,000	693,400	6.93
14	Cricket league and Cycle Marathon	432,000	657,119	638,000	610,800	--	-	-	2,337,919	23.38
15	Sports Material For Children & Youth at Vasahats	197,797	--	--	--	--	-	-	197,797	1.98
16	New Pilot Initiative for Polyculture	398,240	160,000	--	--	--	-	-	558,240	5.58
17	New Pilot Initiative for Cage farming Asian Seabass & Lobster	864,000	660,000	--	--	--	-	-	1,524,000	15.24
18	Sea Weed Culture Project	--	--	--	200,000	--	-	-	200,000	2.00
19	Mangrove Biodiversity Project	--	--	1,890,000	684,000	499,210	997,642	1,135,000	5,205,852	52.06
20	Approach Road restoration at 9 vasahat	--	--	--	--	599,000	942,780	1,011,000	2,552,780	25.53
21	Community trening Centor & Maintenance work	--	--	--	--	--	6,022,000	2,051,000	8,073,000	80.73
TOTAL		24,063,638	20,785,119	15,541,000	20,949,883	12,889,964	21,051,941	18,537,489	133,819,034	1,338.19