adani

Power

Ref: APL/EMD/EC/MoEFCC/271/05/22
Date- 25/05/2022

To,

Additional Principal Chief Conservator of Forest (APCCF)
Ministry of Environment, Forest and Climate Change
Integrated Regional Office (Near Kishan Circle)
Aranya Bhavan, Fourth Floor, Room No 407
Sector 10A, Gandhinagar, Gujarat 382010

Sub: Six Monthly Compliance Status report of Environment Clearances for Phase I, II & III along with Environmental Monitoring reports – reg.

Ref: Env. Clearance letter **J-13011/7/2007-IA-II (T)** dated, 13th August, 2007,
Letter No. **J-13011/1/2008-IA-II (T)** dated, 21st October, 2008 and
Letter No. **J-13012/126/2008-IA-II (T)** dated, 20th May, 2010 & Corrigendum dated 01/06/2011.
Transfer of EC from Adani Power Ltd. to Adani Power (Mundra) Ltd. dated 13.04.2018.

Dear Sir,

With reference to above subject, please find enclosed herewith Half yearly Environment Clearances (EC) compliance status report along with environmental monitoring results like Ambient Air Quality, Noise level, Water Quality, Soil, Met. data, Terrestrial Ecology & Marine Biology, CSR Report, Fly Ash, Green belt development report etc. for the period of **October'2021 to March'2022** in soft (**e-mail**).

This is for your kind information & record please.

Thanking You,
Yours faithfully,
for **Adani Power (Mundra) Limited**

(**Santosh Kumar Singh**)
SVP-Environment
Encl: as above

CC: Member Secretary
Central Pollution control Board
Parivesh Bhavan, East Arjun Nagar
Kendriya Paryavaran Bhawan
New Delhi- 110 032.

Member Secretary,
Gujarat Pollution Control Board
Paryavaran Bhawan, Sector -10 A
Gandhinagar-382 010

The Regional Officer,
Gujarat Pollution Control Board,
Kandla Port Trust Building (KPT)
Gandhidham – Kutchh 370 201

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Adani Corporate House
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SIX MONTHLY COMPLIANCE REPORT OF ENVIRONMENTAL CLEARANCE (EC)

4620 (4×330+5×660) MW THERMAL POWER PLANT PHASE - I, II & III

At

MUNDRA TALUKA, KUTCHH DISTRICT GUJARAT

Submitted to:

Western Regional Office
Ministry of Environment, Forests & Climate Change,
Central Pollution Control Board, New Delhi &
Gujarat Pollution Control Board, Gandhinagar

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Power

Submitted By:

Environment Management Department
Adani Power (Mundra) Limited
Tunda & Wandh Village,
Mundra Taluka, Kutchh District
Gujarat

PERIOD: OCTOBER'2021 – MARCH'2022

Contents

INTRODUCTION

Adani Power (Mundra) Limited (APMuL) is located at village: Siracha & Tunda, Taluka Mundra, District Kutchh in Gujarat.

APMuL has been granted Environmental Clearances from Ministry of Environment, Forest & Climate Change, Consent to Establish (CTE) and Consent to Operate (CTO) from Gujarat Pollution Control Board for Phase I, II & III and has also obtained all necessary statutory / mandatory clearance.

Adani Power Limited, Mundra (APL Mundra) has been restructured and the Mundra Thermal Power Plant has been demerged and transferred to Adani Power (Mundra) Ltd.

Consequent to this De-Merger of 4620 MW Thermal Power Plant, undertaking now vests with Adani Power (Mundra) Limited from 1st January 2018. Ministry of Environment, Forest & Climate Change (MoEF&CC) has Transferred the Environmental Clearances (EC) to Adani Power (Mundra) Limited on 13.04.2018.

Adani Power (Mundra) Limited has commissioned the first supercritical 660 MW unit in the country. Mundra is also the World's First supercritical technology project to have received 'Clean Development Mechanism (CDM) Project' certification from United Nations Framework Convention on Climate Change (UNFCCC).

We have implemented the Environment Management System (EMS) ISO 14001:2015

ADANI POWER (MUNDRA) LIMITED, MUNDRA

Compliance status on Environment Clearance

For 660 MW (2x330) TPP Phase – I

Vide letter No.J-13011/7/2007-IA-II (T) dated 13/08/07

Sr. No.	Conditions	Status
3-(i)	No activities in CRZ area will be taken up without prior requisite clearance under the provisions of the CRZ Notification, 1991.	CRZ Clearance obtained from MoEF&CC vide letter No. 10 - 94/2007- IA - III dated 29th May' 2008. However, the facility for Sea water intake and outfall were not developed by Adani Power Ltd. The CRZ clearance has not been acted upon and the validity of 5 years under the CRZ Notification, 1991 is over. Presently there is no any CRZ clearance with Adani Power (Mundra) Limited. NIO suggested to develop integrated intake and outfall facility in place of multiple intakes and outfalls. This integrated intake & outfall has been approved by MoEF&CC under the clearance for Waterfront Development proposed by APSEZL. APMuL is using this integrated intake and outfall facilities.
(ii)	The seawater intake structure shall be so designed to ensure that the continuity of free flow of water in the two arms of Kotdi Creek is not hampered.	The integrated Intake channel developed by APSEZ is away from Kotdi Creek. The outfall crosses Kotdi Creek at one place, for which aqueduct has been provided so that the treated effluent does not mix with water in the Creek and does not Interfere with free flow of water in the two arms of Kotdi Creek.
(iii)	The recommendations made in the NIO report shall be effectively implemented in the project cycle.	In Subsequent to NIO recommendations, integrated intake & outfall facilities are developed by APSEZ and approved from MoEFCC New Delhi.
(iv)	It shall be ensured that the mangroves are not adversely affected due to the project.	The Thermal Power Plant is located well beyond the CRZ area and there are no mangroves at the plant site.
(v)	The temperature of discharged water shall be continuously monitored to ensure that it does not exceed the prescribed limit of 7°C above the ambient temperature of receiving waters at any point of time.	The temperature of discharge water and the Intake water is monitored on daily basis. Differential temperature is well within the Stipulated limits. Please refer **Annexure V**
(vi)	Space provision shall be made for installation of FGD of requisite efficiency of removal of SO_2, if required at later stage.	Space has been provided for FGD for future requirement. FGD installation is in progress in compliance with the CPCB directions vide letter No.: B- 33014/07/2017-18/IPC-II/TPP/152872, dated 11/12/2017.
(vii)	The total land requirement shall not be exceed 228 Ha for all the activities/facilities relating to the proposed power project.	The project has undergone two expansions. The total area has changed and the same has been approved by MoEF&CC. The total area for all three phases is 452.79 ha.
(viii)	Coal with ash content not exceeding 8% and sulphur content not exceeding 0.69% shall be used as fuel	Being followed. The coal is imported from Indonesia and South Africa. The ash content in coal is below 8% and sulphur content below 0.3%. The Ash content

		report is being sent to MoEF&CC, Regional office on quarterly basis. Ash content report is enclosed as **Annexure- VII.**
(ix)	Rainwater harvesting should be adopted. Central Groundwater Authority/Board shall be consulted for finalization of appropriate rainwater harvesting structure within a period of three months from the date of clearance	Rainwater harvesting (RWH) scheme has been submitted to Regional Office, CGWB, Ahmedabad. We have adopted the scheme and developed rainwater collection & groundwater recharging facilities at three locations within plant premises.
(x)	A bi -flue stack of 220 m height with exit velocity of at least 22 m/s shall be provided with continuous monitoring system.	Complied. A Bi - flue stack of 220 meter height is provided. Online analyzers for PM, SO_2, NO_X have already been provided & maintained and calibration is being done on regular basis, exit velocity is more than 22 m/s. RTDMS commissioned for gas analyzer.
(xi)	High efficiency Electrostatic precipitator (ESPs) having efficiency of 99.9% shall be installed so as to ensure that particulate emissions do not exceed 100 mg/Nm^3.	Complied, ESP with efficiency of 99.9% installed in both the units to meet permissible norm for particulate emissions less than 50 mg/Nm^3. (As we have received renewed "Consent to Operate" (CTO). Please refer **Annexure – I**
(xii)	Fly ash shall be collected in dry form and its 100 % utilization shall be ensured from the day of commissioning of the plant. In case of emergency, the utilized ash may be disposed in the ash pond through High Concentration Slurry Disposal (HCSD) system.	Complied. Ash Generation & utilization details from Oct'2021 to March'2022. Please refer **Annexure- VII.**
(xiii)	Regular monitoring of ground water quality including heavy metals shall be undertaken around ash dyke and project area to ascertain the change, if any, in the water quality due to leaching of contaminants from ash disposal area.	Four nos. of Bore well establish around the ash dyke & Ground water quality is being monitored on regular basis. Ground water analyses report enclosed. Please refer **Annexure VIII.**
(xiv)	Noise level shall be limited up to 75 dB (A). For People working in high noise area, protective devices such as earplugs etc. shall be provided.	Noise level monitoring is being carried out on regular basis inside the plant locations & monitoring values are well within stipulated limits. Please refer **Annexure- I.** We are providing necessary PPE's like ear-muff and ear plug to all employee & workers. Occupational Health & Safety Management System as ISO ISO 45001:2018 implemented.
(xv)	A greenbelt shall be developed all around the plant boundary and ash dyke covering an area of at least 88.2 Ha.	Green belt / plantation being developed in 141.67 Ha (Out of total 452 Ha Land for all three phases). Green belt/plantation is enclosed as **Annexure VI**
(xvi)	First aid and sanitation arrangements shall be made for the drivers and contract labor during construction phase.	Complied. First aid and sanitation were provided for driver and contract labour during construction phase.

(xvii)	Regular monitoring of the air quality shall be carried out in and around the power plant and records shall be maintained. The location of the monitoring stations and frequency of monitoring shall be finalized in consultation with State Pollution Control Board. Six monthly reports shall be submitted to this Ministry.	Being Complied. The regular Environmental Monitoring is being carried out in & around plant premises and reports are being submitted on monthly basis to GPCB regional office, Bhuj. Online continuous AAQ Monitoring systems has been installed in consultation with GPCB and also established five AAQM locations in & around the plant with frequency of twice in a week, monitoring is being carried out by third party. Please refer **Annexure I.**
(xviii)	For controlling fugitive dust, regular sprinkling of water in coal handling area and other vulnerable areas of the plant shall be ensured.	Being Complied. Regular water sprinkling is being done to control the fugitive dust in CHP area and all other areas. In addition to mechanical sweeping machine have been deployed for cleaning the road. To control and minimize the fugitive air pollution at coal handling plant, dust extraction system has been provided in all the transfer towers as well as crusher house. Desalinated water is being used for dust suppression system. Windshield is also provided at coal stack yard area. Close conveyor system for Coal transportation is provided. Integrated Ash silo system (Ash transfer by Numeric system in pipe) is in place for ash handling.
(xix)	The project proponent should advertise within seven day of Environment clearance, in at least two newspapers widely circulated in the region around the project, one of which should be in vernacular language of the locality concerned, informing that the project has been accorded environmental clearance and copies of clearance latter are available with State Pollution Control Board/Committee and may also seen in the Website of Ministry of Environment and Forest in the - http://envfor.nic.in	Complied Published in Two News paper
(xx)	A separate environment-monitoring cell with suitable qualified staff should be set up for implementation of the stipulated environmental safeguards.	Complied. We have established separate environmental management cell with well qualified staff to carry out regular surveillance for implementation of stipulated environmental safeguards and full fledge Environment Lab for Air & Water has been established. **Environment Management System as per EMS ISO 14001: 2015 & Water Efficiency Management System (ISO 46001:2019) implemented.**

(xxi)	Half yearly report on the status of implementation of conditions and environmental safeguards should be submitted to this Ministry, the Regional Office, CPCB and SPCB.	Six monthly compliance report accordance to the Environmental clearance granted by MoEF&CC is being submitted to MoEF&CC, CPCB & GPCB regularly. Compliance status report updated on company's website. Last compliance report was submitted for the period of April'2021 to September'2021 had been submitted vide letter no. APL/EMD/EC/MoEFCC/ 243/11/21 Dated: 17.11.2021.
(xxii)	Regional Office of the Ministry of Environment & Forests located at Bhopal will monitor the implementation of the stipulated conditions. A complete set of documents including Environmental Impact Assessment report, Environment Management Plan and additional information/ clarifications submitted to this ministry subsequently should be forwarded to the Regional Office for their use during monitoring.	Being followed All necessary information forwarded to the MoEF&CC Regional Office, Bhopal on regular basis.
(xxiii)	Separate funds should be allocated for implementation of environmental protection measures along with item-wise break-up. These cost should be included as part of the project cost. The funds earmarked for the environment protection measures should not be diverted for other purposes and year- wise expenditure should be reported to the Ministry.	Being complied. Separate funds allocated for environmental protection measures. Expenditure details from October '2021 to March' 2022 (FY 2021-22) is enclosed as **Annexure IX.**
(xxiv)	Full cooperation should be extended to the Scientists/Officers from the Ministry and its Regional Office at Bhopal/ the CPCB/ the SPCB during monitoring of the project.	Noted Full co-operation shall be extended to the Concerned Authority

ADANI POWER (MUNDRA) LIMITED, MUNDRA

Compliance status on Environment Clearance

For 1980 MW (2x330 + 2x660) TPP Phase – II

Vide letter No. J-13011/1/2008-IA-II (T) dated 21/10/08)

Sr. No.	Conditions	Status
3-(i)	The changes/ modification made in the scope of phase - I of the project should be get incorporated formally in the environmental clearance already granted.	Noted Changes in Phase-I communicated to MoEF&CC
(ii)	Prior CRZ clearance under the provisions of CRZ Notification, 1991 for the activities to be taken up in the CRZ area as applicable to this project, shall be obtained.	CRZ Clearance obtained from MoEF&CC vide letter No. 10 - 94/2007- IA - III dated 29th May' 2008. However, the facility for Sea water intake and outfall were not developed by Adani Power Ltd. The CRZ clearance has not been acted upon and the validity of 5 years under the CRZ Notification, 1991 is over. **Presently there is no CRZ clearance available with Adani Power (Mundra) Limited.** NIO suggested to develop integrated intake and outfall facility in place of multiple intakes and outfalls. This integrated intake & outfall has been approved by MoEF&CC under the clearance for Waterfront Development proposed by APSEZL. APMuL is using this integrated intake and outfall facilities.
(iii)	Regular monitoring of the thermal discharges into the sea shall be carried out and records maintained. The temperature changes, if any, in the sea water within the impact zone due to the project shall be carried out. Based on the same, necessary safeguard measures as may be required to protect the aquatic flora and fauna shall be taken. It shall be ensured that discharge temperature does not exceed the prescribed limits of 7°C above the ambient temperature of receiving waters at any point of time.	Being complied The temperature of discharge water and the intake water is monitored on daily basis. Differential temperatures are well within the stipulated limits. Please refer **Annexure V.** Regular third-party marine monitoring also being carried out, monitoring report is enclosed for the period of October'2021 to March '2022 Please refer **Annexure – III**
(iv)	The recommendations made in the report of NIO relating to intake and outfall shall be implemented.	NIO suggested/recommended to develop integrated intake and outfall facility in place of multiple intake and outfall. This integrated intake & outfall has been approved by MoEF under the clearance for Waterfront Development proposed by APSEZL. APMuL is using this integrated intake and outfall facility.
(v)	The sulphur content in the coal to be used both for Phase–I and Phase-II shall not exceed 0.3 %.	Being followed The coal is imported from Indonesia and South Africa. It is ensured that sulphur

		content in coal below 0.3%.
(vi)	Appropriate measures shall be adopted to reduce the emissions of SO_2. It shall also be ensured that at no point of time the ground level concentration of SO_2 in the impact zone exceeds the prescribed limit. The proponent shall also provide, additional corrective measures as may be deemed necessary shall be taken.	Being Complied. The regular monitoring is being carried out in & around the plant premises. We have already installed online continuous monitoring system in all stacks. At no point of time, the ground level concentration of SO_2 has exceeded the permissible limits.
(vii)	Continuous meteorological data shall be collected at site for at least three years. Based on the data so collected, air quality modeling prediction shall be carried out. The results so obtained shall be analyzed and based on the same, additional corrective measures as may be deemed necessary shall be taken.	Complied. Continuous meteorological stations installed within plant premises; Details of metrological data observation enclosed as **Annexure I.**
(viii)	Two bi-flue stacks of 275 m height each for 2 X 330MW and 2 X 660 MW units shall be provided with continuous online monitoring equipments for SO_2, NOx and Particulate. Exit velocity of Flue gases shall not be less than 22.27 m/sec for 2 X 330MW stack and 22.97 m/sec for 2 X 660 MW units.	Complied Two bi-flue stacks 275 meters has been provided in all four boilers (2x330 MW + 2x660 MW) and online continuous emission monitoring system (CEMS) installed for PM, SOx & NOx. Exit velocity is more than 23 m/sec & records are being maintained. Please refer **Annexure I.** Regular stack emission monitoring is also being carried out by third party laboratory.
(ix)	High efficiency electrostatic precipitators (ESP's) shall be installed to ensure that particulate emission does not exceed 50 mg/ Nm^3	Complied Highly efficient Electrostatic Precipitator (ESPs) has been provided to each boiler to maintain particulate emission less than 50 mg/Nm^3. Please refer **Annexure I.**
(x)	The seawater intake structure shall be so designed to ensure that the continuity of free flow of water in the two arms of Kotdi creek is not hampered	The integrated Intake channel developed by APSEZ is away from Kotdi Creek. The outfall channel Crosses Kotdi Creek at one place, for which aqueduct has been provided so that the treated effluent does not mix with Creek water and does not Interfere with free flow of water in the two arms of Kotdi Creek.
(xi)	It shall be ensured that the mangroves are not adversely affected due to the project.	The Thermal Power Plant is located well beyond the CRZ area and there are no mangroves at the plant site.
(xii)	Cooling towers with closed cycle system shall be installed COC of at least 1.5 shall be maintained.	Being Complied COC of 1.5 is being maintained
(xiii)	Space provision shall be made for installation of FGD of requisite efficiency of removal of SO2, If required at later stage.	Noted Space for FGD has been provided in the plant as per the guidelines of CPCB vide letter No. B-33014/07/2017/IPC-II/TPP/ 15872 dated 11.12.2017. However, as per MoEFCC Notification date 31st March 2021, Mundra TPP is falling under Category "C"

		Non- retiring TPPs and the timelines for compliance of SO_2 emission is up to December 2024. Accordingly, the work is under progress for compliance as per CPCB direction.
(xiv)	The total land requirement shall not exceed 254.49 ha for all the activities/ facilities relating to Phase - I and Phase - II of the proposed power project.	Noted The project has undergone two expansions. The total area has changed and the same has been approved by MoEF&CC. The total area for all three Phases is 452.79 ha.
(xv)	Rainwater harvesting should be adopted. Central Groundwater Authority/Board shall be consulted for finalization of appropriate rainwater harvesting structures within a period of three months form the date of clearance.	Rainwater Harvesting (RWH) scheme has been submitted to RO, CGWB, Ahmedabad. We have adopted the scheme and developed rainwater collection & groundwater recharging facilities at three locations within plant premises.
(xvi)	Fly ash shall be collected in dry form and its 100 % utilization shall be ensured from the day of the commissioning of the plant. In case of emergency, the utilized ash may be disposed in the ash pond through High Concentration Slurry Disposal (HCSD) system and bottom ash in conventional slurry mode.	Being Complied Ash Generation & utilization details from October' 2021 to March' 2022 is enclosed as **Annexure VII.**
(xvii)	Adequate safety measures shall be provided in the plant area to check/ minimize spontaneous fires in coal yard, especially during summer season. Copy of these measures with full details along with plant layout location shall be submitted to the ministry as well as to the Regional Office of the Ministry of Bhopal.	Water sprinkler system and Hydrant system in operation to minimize spontaneous fires in coal yard.
(xviii)	Storage facilities for auxiliary liquid fuel such as LDO and HFO/LSHS shall be made in the plant area where risk is minimum to the storage facilities Disaster management Plan shall be prepared to meet any eventuality in case of accident taking place. Mock drills shall be conducted regularly and based on the same, modifications required, if any shall be incorporated in the DMP. Sulphur content in the liquid fuel will not exceed 0.5 %.	The LDO and HFO / LSHS are stored in designated location and minimum risk area. Emergency Management Plan (EMP) has been prepared & Mock Drill is being conducted on regular interval. Occupational Health & Safety Management System as ISO 45001:2018 implemented.
(xix)	Noise levels emanating from turbines shall be limited to 75 dBA. For people working in the high noise area, requisite personal protective equipment like earplugs/earmuffs etc. Shall be provided. Workers engaged in noisy areas such as turbine area, air compressors etc shall be periodically examined to maintain audiometric record and for treatment for any	Regular noise level monitoring is being carried out inside the plant locations & monitoring values are well within limits. Please refer **Annexure- I.** We are providing necessary PPE's like earmuff and ear plug to all employees & workers. Occupational Health & Safety Management System as ISO 45001:2018

	hearing loss including shifting to non - noisy/less noisy areas.	implemented.
(xx)	Regular monitoring of ground water quality including heavy metals shall be undertaken around ash dyke and the project area to ascertain the change, if any, in the water quality due to leaching of contaminants from ash disposal area.	Being complied Four nos. of Bore well establish around the ash dyke & Ground water quality is being monitored on regular basis. Please refer monitoring report in **Annexure-VIII.**
(xxi)	A greenbelt shall be developed all around the plant boundary and ash dyke covering and area of at least 98.2 ha.	Complied. Green belt / plantation being developed in 141.67 Ha. (Out of total 452.79 Ha Land for all three phases) Green belt / plantation is enclosed as **Annexure VI.**
(xxii)	First aid and sanitation arrangements shall be made for the drivers and contract labour during construction phase.	Complied. First aid and sanitation were provided for driver and contract labour during construction phase.
(xxiii)	Regular monitoring of ground level concentration of SO_2, NOx, Hg, SPM and RSPM shall be carried out in the impact zone and records maintained. If at any stage these levels are found to exceed the prescribed limits, necessary control measures shall be provided immediately. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the Regional Office of this Ministry.	Being Complied The regular Environmental Monitoring is being carried out in & around plant premises and reports are submitted to MoEF&CC, CPCB & GPCB. Please refer **Annexure- I** Online continuous monitoring systems Installed in consultation with GPCB. AAQM monitoring in and around also being done by third party twice in a week. Please refer **Annexure – IV**
(xxiv)	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	Complied Proper housing and infrastructure facilities were provided to labors during the construction. The temporary facilities have been removed after the completion of project.
(xxv)	The project proponent shall advertise in at least two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned within seven days form the date of this clearance letter, informing that the project has been accorded environmental clearance and copies of clearance letter are available with the State Pollution Control Board/ Committee and may also be seen at website of the Ministry of	Complied

	Environment and Forests http://envfor.nic.in	
(xxvi)	A separate environment management cell with qualified staff shall be set up for implementation of the stipulated environment safeguards.	We have established separate environmental monitoring cell with well-qualified staff to carry out regular surveillance for implementation of stipulated environmental safeguards and full fledge Environment Lab accredited with NABL ISO/IEC 17025:2017 for Air, Water & Noise including marine biology as well as terrestrial ecology regularly. **Environment Management System as per EMS ISO 14001: 2015 Water Efficiency Management System (ISO 46001:2019) implemented.** Terrestrial monitoring report enclosed as Annexure -II and Marine monitoring Report is enclosed as Annexure – III.
(xxvii)	Half yearly on the status of implementation of stipulated condition and environmental safeguards shall be submitted to this Ministry/Regional office /CPCB/SPCB.	Six monthly compliance report accordance to the Environmental clearance granted by MoEFCC being submitted to MoEFCC, CPCB & GPCB. Last compliance report was submitted for the period of April'2021 to September'2021 had been submitted vide letter no. APL/ EMD/EC/MoEFCC/243/11/21 Dated: 17.11.2021.
(xxviii)	Regional office of the Ministry of Environment & Forest located at Bhopal will monitor the implementation of the stipulated conditions. A complete set of documents including Environmental Impact Assessment - Report and environment Management Plant along with the additional information submitted from time to time shall be forwarded to the Regional office for their use during monitoring.	Being followed All necessary documents already submitted to MoEF&CC, Regional Office Bhopal. Addition information being forwarded time to time MoEF&CC, Regional Office Bhopal.
(xxix)	Separate funds shall be allocated for implementation of environmental protection measures along with item wise break up. These cost shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year wise expenditure shall not be diverted for other purposes and year wise expenditure should be reported to the Ministry.	Being followed Separate funds allocated for environmental protection measures. Expenditure details from Oct' 2021 to March 2022 (F.Y. 2021-22) is enclosed as **Annexure-IX.**
(xxx)	The project authorities shall inform the Regional office as well as the Ministry regarding the date of financial closure and final approval of the project by the concerned authorities and the dates of start of land development work and commissioning of	Complied

	plant.	
(xxxi)	Full cooperation shall be extended to the Scientists/Officers from the Ministry /Regional Office of the Ministry at Bhopal/the CPCB/ the SPCB who would be monitoring the compliance of environmental status.	Noted Full co-operation shall be extended to mentioned authority.

ADANI POWER (MUNDRA) LIMITED, MUNDRA

Compliance status on Environment Clearance
For 1980 MW (3x660) TPP Phase – III
Vide letter No. J-13012/126/2008-IA.II (T) dated 20.05.10

Sr. No.	Specific Conditions	Status
A -(i)	Phase – I and Phase – II projects shall be run purely on imported coal. Phase- III project shall be run on 70 % domestic and 30 % imported coal.	Phase - I & II: Already commissioned being operated on imported coal. Phase-III: Domestic Coal Linkage for 70 % quantity granted by Ministry of Coal. Operational on blended coal.
(ii)	In case source of fuel supply is to be changed for Phase- I and Phase- II at a later stage, the project proponent shall intimate the Ministry well in advance along with necessary requisite documents for its concurrence for allowing the change.	Noted. Change in the source of fuel supply for power plant will be intimated to the Ministry well in advance along with necessary requisite documents for its concurrence for allowing the change.
(iii)	The project proponent shall examine in detail the possibility to adopting NIOT technology for desalination of sea water through Low temperature Thermal Desalination (LTTD) process. In case the same is not feasible detailed explanation shall be submitted.	Complied. The desalination plant is already commissioned. The LTTD process is not feasible at Mundra and report already submitted to RO, MoEF&CC, Bhopal
(iv)	Marine biology shall not be disturbed in the Kotdi Creek and Gulf of Tunda due to any activity arising from the operation of power plant. Continuous monitoring of the marine biology in the area shall be undertaken and assessed for any changes beyond the natural variability identified and records maintained and submitted to the Ministry from time to time.	Complied. The integrated intake channel developed by APSEZL is away from Kotdi Creek, which is used by APMuL also. The integrated outfall developed by APSEZL and being used by APL, crosses Kotdi Creek, through aqueduct without mixing with Kotdi Creek and without causing any obstruction to free flow. Marine biology monitoring is being monitored on regular basis. Monitoring report prepared by third party is enclosed as **Annexure – III**.
(v)	A comprehensive marine biological quality monitoring programme and mitigation measures shall be prepared and submitted within six months to the Ministry for immediate implementation.	Being Complied. A comprehensive marine biological quality monitoring report is prepared and implementation. Report being submitted to MoEF&CC. Monitoring report is enclosed as **Annexure – III**.
(vi)	A dedicated Environment Management Cell with suitable qualified personnel constituting of marine Biologist and an ecologist shall be set up under the control of a Senior Executive, who will report directly to the head of the Organization.	A dedicated Environment Management cell has been set up with qualified staff Including marine biologist and an ecologist. The head of the Environment Management Cell reports to the Station Head at Mundra. We have full-fledged Environment Lab accredited with NABL ISO/IEC 17025:2017 to carry out in-house environmental monitoring. **Environment Management System as per EMS ISO 14001: 2015 & Water Efficiency Management System (ISO 46001:2019) implemented.**
(vii)	The project proponent shall not be hamper	The power plant is located at a site, which is away from the fishing areas. Adani Power

	the vocation of the fishing community in the area and it shall be ensured that local fishing community shall be allowed to carry out their vocation in the creek.	(Mundra) Ltd. uses the marine facilities such as intake channel and outfall channel, developed by APSEZ Ltd., which is not hampering the vocation of fishing community. Our CSR activities enhance infrastructure & essential nets to fishermen communities for the betterment of their vocation in the area. Please refer **Annexure X.**
(viii)	The project proponent shall adopt the fishing communities displaced/ affected by the power plant and in particular those residing in and around Zarpara, Kotdi, Navinal, and Tragadi for their overall socio-economic development.	No fishing community is displaced by the power plant. The fishing community is being supported by the CSR activities of the company, being implemented through **Adani Foundation.** The CSR report is enclosed as **Annexure –X.**
(ix)	An endowment of Fisherman Welfare Fund shall be created not only to enhance their quality of life through creation of facilities for fish landing platforms/ fishing harbour/cold storage, but also to provide relief in case of emergency situations such as missing of fisherman on duty due to rough seas, tropical cyclone and storms etc.	APMuL provided adequate funds for creation, maintenance and support of facilities such as sanitation facilities, support schools, approach roads, cycle to school going children, fish lending sheds etc. as well as support for purchasing various essential materials like nets, cycle, iceboxes, anchors, weighing scales, other fishing equipment's etc. All these activities are undertaken as a part of CSR, being implemented through Adani Foundation. Adani Foundation has also established "**Adani Vidya Mandir"** a school focusing on education of fisherman's children. Refer **Annexure X.**
(x)	Suitable screens (in stages) shall be placed across intake channel to prevent entrainment of life forms including eggs, larvae, juvenile fish, plankton etc. during extraction of sea water.	Being complied. Suitably designed screen systems have been provided in the intake system.
(xi)	No ground water shall be extracted for use in operation of the power plant even in lean season.	Being Complied. There is no extraction of Ground water for use in operation of the power plant.
(xii)	No water bodies including natural drainage system in the area shall be disturbed due to activities associated with the setting up/operation of the power plant.	Being Complied. No ground water bodies/natural drainage will be disturbed.
(xiii)	FGD shall be provided for Phase- III units.	Complied. Sea water based FGD has been provided.
(xiv)	The system with COC of at least 1.3 shall be designed since the sea water has high TDS.	Being complied. COC of least 1.3 is being maintained
(xv)	Additional soil for leveling of the proposed site shall be generated within the sites (to the extent possible) so that natural drainage system of the area is protected and improved.	Complied. For leveling the site, the maximum additional soil has been generated within the site itself and maintained natural drainage system of the area.

(xvi)	High Efficiency Electrostatic Precipitator (ESPs) shall be installed to ensure that particulate emission does not exceed 50 mg/Nm³.	Complied, High efficient Electrostatic Precipitator (ESPs) has been provided to each boiler to maintain particulate emission less than 50 mg/Nm³. Please refer **Annexure-I**
(xvii)	Adequate dust extraction system such as cyclones/beg filters and water spray system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided.	Water spraying system is provided in coal handling area and dust extraction system provided in coal transfer & other vulnerable dusty area. Closed conveyor system for Coal transportation is provided. Wind shield around coal stack has been provided. Integrated Ash silo system (Ash transfer by pneumatic system through pipeline) is in place for ash handling at single place and frequently water sprinkling is being done in the area.
(xviii)	Utilization of 100 % Fly Ash generated for Phase-III shall be made from day one of operation of the plant. Status of implementation shall be reported to the regional office of the Ministry from time to time.	Being complied Ash Generation & utilization details from Oct' 2021 to March' 2022 Please refer **Annexure- VII.**
(xix)	Fly ash shall be collected in dry form and storage facility (silos) shall be provided. Unutilized fly ash shall be disposed off in the ash pond in the form of slurry form. Mercury and other heavy metals (As, Hg, Cr, Pb etc.) will be monitored in the bottom ash as also in the effluents emanating from the existing ash pond. No ash shall be disposed off in low lying area.	Being followed Fly Ash is collected in dry form and storage silos have been provided. Unutilized ash is wet conditioned for disposal in Ash Dyke. Mercury and heavy metals are periodically monitored in the ash. No ash from Phase III Units is disposed off in low-lying area.
(xx)	Ash pond shall be lined with HDP/LDP lining or any other suitable impermeable media such that no leachate takes place at any point of time. Adequate safety measures shall also be implemented to protect the ash dyke from getting breached.	Ash dyke is provided with LDPE Lining. Safety measures are in place to prevent breaching of the dyke.
(xxi)	For disposal of Bottom Ash in abandoned mines (if proposed to be undertaken) if shall be ensured that the bottom and sides of the mined-out areas are adequately lined with clay before Bottom Ash is filled up. The project proponent shall inform the State Pollution Control Board well in advance before undertaking the activity.	No mines in the near by area.
(xxii)	There should not be any contamination of soil, ground and surface waters (Canals &	Being complied. The Sea water is used within the plant premises only and in closed circuit. There is no

	village pond) with sea water in and around the project sites. In other wards necessary preventive measures for spillage from pipelines, such as lining of guard pond used for the treatment of outfall and intake should be adopted. This is just because the areas around the projects boundaries fertile agriculture and used for paddy cultivation.	contamination of soil, ground and surface water. There are no agricultural lands on see ward side of the power plant.
(xxiii)	To absorb the ground level pollutants, to act buffer against strong winds arising out of tropical cyclones/ storms, to reduce heat load and ameliorate environment, there is a need for shelterbelts/greenbelts/tree cover along the coastline, bunds around marshy areas, roadsides, around the project protected monuments, forts, waste places, School Campuses and other vacant lots. Coconut plantations can be developed along the coastline and near villages, school and forts. Stands of Casuariana should also be developed on some dunes and along coasts. Bamboos, Neem and other native trees should be planted in and around at the villages.	Being complied. Green belt / plantation developed in 141.67 Ha (Out of total 452.79 Ha Land for all three phases). Afforestation has been undertaken by APSEZL and Adani Foundation. Please refer **Annexure – VI**
(xxiv)	The above suggest Green Belt shall consist of 3 tires of plantation as cited above and largely comprising of native species around the power plant and at least 100 m width shall be raised. Wherever 100 m width is not feasible a 50 m width shall be raised and adequate justification shall be submitted to the regional office of the Ministry. Tree density shall not less than 2500 per ha with survival rate not less than 70 %.	Being complied. Green belt Being developed in & around plant area. We have well established Horticulture Department which has started large scale plantation/ Green Belt developed in and around the plant.
(xxv)	To meet the expenditure of these plantations and their management, a common Green Endowment fund should be created by the project proponents out of EMP budgets the interest earned out of it should be used for the development and management of green cover of the area.	APMuL has internal department of Horticulture for developing greenbelt/landscaping of our APMuL premises and its surrounding area. APMuL has separate fund for such development.
(xxvi)	No wastewater should be discharged onto channel systems, backwaters, marshy areas and seas without treatment. The outfall should be first treated in guard pond and then discharge into deep sea (12 to 15 m depth). Similarly, the intake should be from	The wastewater is treated and disposed off through Outfall Channel, as recommended by NIO and approved by MoEF&CC.

	deep sea to avoid aggregation of fish. The brine that comes out from desalinization plants should not be discharged into sea.	
(xxvii)	The treated effluents conforming to the prescribed standards only shall be re circulated and reused within the plant (as may be required). Arrangements shall be made that effluent and storm water do not get mixed.	Desalination wastewater is treated and utilized for dust suppression, CHP make up, etc. effluent stream and storm water drainage are isolated to prevent any mixing.
(xxviii)	The project proponent shall identify and develop new fodder farm/grazing land (Gaucher land) Firm financial commitment along with details for development of fodder farm/grazing land shall be submitted within three months to the Regional Office of the Ministry.	Fodder support is provided to various needy villages so as to facilitate the farmers and cattle owners in the time of need when fodder is highly expensive and in short supply, CSR report enclosed as **Annexure X**.
(xxix)	The project proponent shall prepare an action plan to be submitted within three months to the Ministry for regeneration of mangroves in the area and shall specify the financial commitments for the same.	Mangrove plantation plan along with regeneration plan submitted to MoEF&CC. To enhance the marine biodiversity, till date Adani group has carried out mangrove afforestation in more than 2800 ha. Area across the coast of Gujarat.
(xxx)	The water containing brine shall be discharged only after cooling at ambient temperature in a guard pond such that the same meets the average salinity of sea water.	Being complied The wastewater is treated and disposed off through Outfall Channel, as recommended by NIO and approved by MoEF&CC
(xxxi)	The project proponent shall set up single teacher school in every village in the study area so that village boy and girls do not have to walk long distances. The project proponent shall also explore the feasibility of providing cycles to school going children/students to address school dropouts. Report to this effect shall be submitted to the Regional Office of the Ministry from time to time.	All school of the surrounding villages adopted for development by Adani Foundation, CSR activities being done by Adani Foundation. CSR Progress Report is enclosed for 2021-22 as **Annexure – X.**
(xxxii)	Action plan for R&R (If applicable) with compensation package of the project affected persons be submitted and implemented as per prevalent R&R policy within three months from the date of issue of this letter.	Not applicable.
(xxxiii)	An amount of Rs. 36.0 Crores shall be earmarked as one-time capital cost for CSR programme. Subsequently a recurring expenditure of Rs. 7.20 Crores per annum shall be earmarked as recurring expenditure	Complied. A separate budget earmarked for CSR activities. CSR study report already submitted to ministry. CSR activities being carried out by Adani Foundation.

	for CSR activities. Details of the activities to be undertaken shall be submitted within one month along with road map for implementation.	Expenditure details from Oct'2021 to March' 2022 (F.Y.2021-22) is enclosed as **Annexure-IX.**
(xxxiv)	While identifying CSR programme the company shall conduct need-based assessment for the nearby villages to study economic measures with action plan which can help in upliftment of poor section of society. Income generating projects consistent with the traditional skills of the people besides development of fodder farm, fruit bearing orchrds, vocational training etc, can form a part of such programme. Company shall provide separate budget for community development activities and income generating programmes. This will be in addition to vocational training for individuals imparted to take up self employment and jobs. In addition, a special scheme for upliftment of SC/ST's and mariginalised population in the study area out of CSR programme shall be formulated and submitted to the Ministry within six months along with firm commitment of implementation. The scheme shall have an in-built monitoring mechanism.	Need based Assessment Study for development of CSR plan completed by VIKSAT, Ahmedabad. Report already submitted to MoEF&CC. Need based plan implementation is being started nearby villages; individuals who are economically weak to undertake some economic activity that would help them achieve sustainable livelihood and financial independence. Please Refer **Annexure X.**
(xxxv)	If shall be ensured that in-built monitoring mechanism for the schemes identified is in place and annual social audit shall be got done from the nearest government institute of repute in the region. The project proponent shall also submit the status of implementation of the scheme from time to time.	Being complied Indian Institute of Social Welfare and Business Management (IISWBM) of university of Kolkata have done the social audit. Final Social Audit Report is awaited from IISWBM. Final Social Audit Report has been submitted in Six monthly compliance report-Apr'15 to Sep'15. **Implementation of Social Accountability 8000** ISO SA8000:2014 **is in progress.**
B	**General Conditions:**	**Status**
(i)	A sewage treatment plant shall be provided (as applicable) and the treated sewage shall be used for raising greenbelt/plantation.	Sewage Treatment Plants (STP) installed within the plant and treated water being utilizing/recycle within the plant remises for plantation and green belt development.
(ii)	Rainwater harvesting should be adopted. Central Groundwater Authority/ Board shall be consulted for finalization of appropriate rainwater harvesting technology within a period of three months from the date of clearance and details shall be furnished.	Being Complied. Rainwater Harvesting (RWH) scheme has been submitted to RO, CGWB, Ahmedabad. We have adopted the scheme and developed rainwater collection & groundwater recharge facilities at three locations within plant premises.
(iii)	Adequate safety measures shall be provided	Proper fire fighting and fire hydrant system has

	in the plant area to check/minimize spontaneous fires in coal yard, especially during summer season. Copy of these measures with full details along with location plant layout shall be submitted to the Ministry as well as to the Regional Office of the Ministry.	been provided in the coal stack yard. **Occupational Health & Safety Management System as** ISO 45001:2018 **implemented.**
(iv)	Storage facilities for auxiliary liquid fuel such as LDO and /HFO /LSHS shall be made in the plant area in consultation with department of Explosives, Nagpur. Sulphur content in the liquid fuel will not exceed 0.5 %. Disaster Management Plan shall be prepared to meet any eventuality in case of an accident taking place due to storage of oil.	The LDO and HFO/LSHS properly stored in minimum risk area. A Disaster management plan will be prepared covering the all the eventualities in case of accident due to storage of oil. On site plan has already been made and implemented. Disaster management Plan has already been prepared and implemented. **Occupational Health & Safety Management system as** ISO 45001:2018 **implemented.**
(v)	Regular monitoring of ground water level shall be carried out be establishing a network of existing wells and constructing new piezometers. Monitoring around the ash pond area shall be carried out particularly for heavy metals (Hg, Cr, As, Pb) and records maintained and submitted to the Regional Office of this Ministry. The data so obtained should be compared with the baseline data so as to ensure that the ground water quality is not adversely affected due to the project.	Being Complied Four nos. of Bore well establish around the ash dyke & Ground water quality monitored on regular basis by third party and periodic report being submitted to the MoEF&CC. Please refer **Annexure VIII.**
(vi)	First aid and Sanitation arrangement shall be made for the drivers and other contract workers during construction phase.	Complied First aid and sanitation were provided for driver and contract labour during construction.
(vii)	Noise levels emanating from turbines shall be so controlled such that the noise in the work zone shall be limited to 75 dBA. For people working in the high noise area, requisite personal protective equipment like earplugs/earmuffs etc. shall be provided. Workers engaged in noisy areas such as turbine area, air compressors etc shall be periodically examined to maintain audiometric record and for treatment for any hearing loss including shifting to non noisy/less noisy areas.	Being complied Necessary action has been taken to maintain noise level 75dB (A). The working personals provided with appropriate personal protective equipment and periodic audiometric check up is being carried out and records are maintained. Regular noise level monitoring is being carried out inside the plant locations & monitoring values are well within limits. Please refer **Annexure- I.** **Occupational Health & Safety Management System as** ISO 45001:2018 **implemented.**
(viii)	Regular monitoring of ground level concentration of SO_2, NOx, $PM_{2.5}$ & PM_{10} and Hg shall be carried out in the impact zone and records maintained. If at any stage these levels are found to exceed the prescribed limits, necessary control measures shall be	Being complied. Regular monitoring of PM10, PM2.5, SO2, NOX and Hg is being carried out by third party consultant as well as in house and records are maintained. Online Continuous Ambient Air Quality Monitoring System has been installed at three

	provided immediately. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the Regional Office of this Ministry. The data shall also be put on the website of the company.	various locations within the plant premises. Monitoring result is available & within the permissible limits. Monitoring reports being submitted to regional office of the MoEF&CC, CPCB and GPCB periodically. Please refer **Annexure – I**
(ix)	Provision shall be made for the made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	The temporary facilities removed after the Completion of project.
(x)	The project proponent shall advertise in at least two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned within seven days from the date of this clearance letter, informing that the project has been accorded environmental clearance and copies of clearance letter are available with the State Pollution Control Board/Committee and may also be seen at Website of the Ministry of Environment and Forests at http://envfor.nic.in	Complied. Advertisement published in the local newspaper.
(xi)	A copy of the clearance letter shall be sent by the proponent to concern Panchayat, Zila Parisad /Municipal Corporation, urban local Body and the Local NGO, if any, from whom suggestions/representations, if any, received while processing the proposal: The clearance letter shall also be put on the website of the Company by the proponent.	Complied.
(xii)	A separate Environment Management cell with qualified staff shall be set up for implementation of the stipulated environment safeguards.	We have established separate environmental monitoring cell with well qualified staff to carry out regular surveillance for implementation of stipulated environmental safeguards and full-fledged Environment Lab accredited with NABL ISO/IEC 17025:2017 to carry out in-house monitoring of Air, Water & Noise as well as terrestrial & marine ecology regularly. **Environment Management System as per EMS ISO 14001: 2015 & Water Efficiency Management System (ISO 46001:2019) implemented.**

		Terrestrial monitoring report enclosed as Annexure – II and Marine monitoring Report is enclosed as Annexure – III.
(xiii)	The proponent shall upload the status of compliance of the stipulated EC conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the regional office of MOEF, the respective Zonal Office of CPCB and SPCB. The criteria pollutant levels namely; SPM, RSPM ($PM_{2.5}$, & PM_{10}), SO_2, NO_X (ambient levels as well as stack emissions) shall be displayed at a convenient location near the main gate of the company in the public domain.	Six monthly Environmental Clearance compliance status report is regularly submitted to MoEF&CC, CPCB and SPCB. The same is sent by email also. Compliance status updated on Company's website. Regular monitoring of PM_{10}, $PM_{2.5}$, SO_2, NO_X and Hg is being carried out by third party and records are maintained. Please refer **Annexure I.** Display board is already installed in main gate.
(xiv)	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well by e-mail) to the respective Regional Office of MOEF, the respective Zonal office of CPCB and SPCB.	Being Complied Half yearly compliance report is regularly submitted to MoEF, CPCB & SPCB. The same is sent by email also. Compliance status updated on Company's website. Last compliance report was submitted for the period of April'2021 to September'2021 had been submitted vide letter no. APL/EMD/EC/ MoEFCC/243/11/21 Dated: 17.11.2021.
(xv)	The environment statement for each financial year ending 31st March in Form V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website, of the company along with the status of compliance of EC conditions and shall also be sent to the respective Regional Offices of the Ministry by e-mail.	Being complied, Regular environment statement is being submitted to the Gujarat Pollution Control Board (GPCB).
(xvi)	The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the ministry of Environment and Forests, its Regional Office, Central Pollution Control Board and State Pollution Control Board. The project proponent shall upload the status of compliance of the environment of the environmental clearance conditions on their website and update the same periodically and simultaneously send the same by e-mail to the Regional Office, Ministry of Environment and Forests.	Six monthly Environmental Clearance compliance status report is regularly submitted to MoEF&CC, CPCB and SPCB. The same is sent by email also. Compliance status updated on Company's website.

(xvii)	Regional Office of Ministry of Environment and Forest will monitor the implementation of the stipulated conditions. A complete set of documents including Environment Impact Assessment Report and Environment Management Plan along with the additional information submitted from time to time shall be forwarded to the regional office for their use during monitoring. Project proponent will upload the compliance status in their website and update the same from time to time at least six monthly basis. Criteria pollutants levels including NOx (from stack & ambient air) shall be displayed at the main gate of the power plant.	Being Complied. Display board already installed in main gate.
(xviii)	Separate funds allocated for implementation of environmental protection measures along with item wise breakup. This cost shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year wise expenditure should be reported to the Ministry.	Being Complied. Separate funds allocated for environmental protection measures. Expenditures details F.Y. 2021-22 is enclosed as **Annexure-IX.**
(xix)	The project authorities shall inform the Regional Office as well as the Ministry regarding the date of financial closure and final approval of the project by the Concerned authorities and the dates of start of land development work and commissioning of plant.	Complied
(xx)	Full cooperation shall be extended to the scientists/ officers from the Ministry/Regional office of the Ministry at Bangalore/CPCB/ the SPCB who would be monitoring the compliance of environmental status.	Noted, Full co-operation shall be extended to mentioned authority always.

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ENVIRONMENTAL MONITORING REPORT

AMBIENT AIR QUALITY, STACK EMISSION, WATER QUALITY AND NOISE MONITORING

Period: October 2021- December 2021

For

M/s. ADANI POWER (MUNDRA) LIMITED

At
Tunda & Siracha,
Tal. Mundra, Dist.: Kutch.
KUTCH, GUJARAT – 370 435

Prepared By

UniStar
Environment & Research Labs Pvt. Ltd.

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QUALITY CONTROL							
Name of Publication	Environmental Quality Monitoring Report for the Quarter October 2021- December 2021						
Project Number	03	**Report No.**	UERL/ENV/OCT/ 10-12 / 2021	**Version**	1	**Released**	January 2022
Project Coordinator	Mr. Bhavin Patel						
Prepared By	Miss. Shweta A. Rana						
Checked By	Mr. Jaivik Tandel						
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FOR
UniStar Environment and
Research Labs Pvt. Ltd.

Mr. Jaivik Tandel
(Authorized By)

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LIST OF GRAPHS

EXECUTIVE SUMMARY

Adani Power (Mundra) Limited (APMuL) has total generation capacity of 4620MW in phased manner at Mundra Thermal (coal Based) Power Plant near Village Tunda in Mundra, District Kutch, and Gujarat. The phased wise development being undertaken for ultimate capacity of power plant is shown below.

- First Phase : 2 x 330 MW
- Second Phase : 2 x 330 MW + 2 x 660 MW
- Third Phase : 3 x 660 MW

The Thermal Power Plant is located near Village Tunda, Mundra Taluka in Kutch District. The Site is closed to the sea, making cooling water perennially available for the power plant. The Power Plant is based on supercritical technology using imported coal.

All three phase of the power plant is operational and as the part of the compliance to the statutory requirement, M/s. Adani Power (Mundra) Limited has entrusted the environmental quality monitoring study for the area surrounding the power plant. Adani Power (Mundra) Limited Implemented ISO-14001:2015 Environment Management System (EMS) and Accreditation of NABL in Environmental Laboratory (ISO/IEC 17025:2017) vide Certificate No. TC-5215.

Various environmental parameters have been monitored during the period of October 2021 to December 2021.The detail of the environmental parameters along with frequency of monitoring is shown in subsequent sections.

1. ENVIRONMENTAL PARAMETERS

Sr. No.	Environmental Indices	Parameter	No. of Location and Monitoring.	Frequency of Sampling
1.	Ambient Air Quality	PM_{10}, $PM_{2.5}$, Sulphur Dioxide and Nitrogen Dioxide	Three Location	Twice a week
2.	Ambient Air Quality	PM_{10}, $PM_{2.5}$, Sulphur Dioxide, Nitrogen Dioxide, Ozone and Mercury	Two Location	Once in a month
3.	Stack Monitoring	PM, Sulphur Dioxide, Oxide of Nitrogen and Hg	Nine Location	Once in a month
4.	Meteorological Monitoring	Wind rose, Wind speed, Wind direction, Rainfall, Temperature, Relative Humidity	One location	Round the clock
5.	Surrounding Villages Ground Water Analysis	Colour, Odour, Taste, Turbidity, Dissolved Solids, pH value, Total Hardness, Calcium, Boron, Copper, Iron, Manganese, Chloride, Sulphate, Nitrate, Fluoride, Phenolic Compounds, Mercury, Cadmium, Selenium, Arsenic, Cyanide, Lead, Zinc, Anionic Detergents as MBAS, Chromium Cr+6, Mineral Oil, MPN Index for Coliform Bacteria per 100 ml, Residual Free Chlorine, Aluminium, Alkalinity, Magnesium as Mg, Escherichia Coli in 250 ml.	Five Location	Once in Quarter
6.	Effluent Water Sample	pH, Temperature, colour, SS, O & G, BOD3, COD, Chlorides, TDS, Sulphates, Ammonical Nitrogen, % Sodium, Sodium Absorption Ratio, Sulphides, Total Chromium, Hexavalent Chromium, Copper, Lead, Zinc, Free available chlorine, Phosphate, Iron	Four Location	Once in a month / Quarter
7.	STP Water Analysis	pH, Residual Chlorine, SS, BOD, COD, Faecal coliform	Three Location	Once in month/ Quarter
8.	Borwell water Near Ash Dyke Area	pH @ 25 ° C, Conductivity (µS), Chloride as Cl^- Salinity (ppt), Total Dissolved Solids, Carbonate as CaCO3, Bicarbonate as CaCO3, Mercury as Hg,Arsenic as As, Lead as Pb, Chromium as Cr, Cadmium as Cd.	Four Location	Once in a Quarter
9.	Surrounding Villages Soil Analysis	Magnesium as Mg %, Molybdenium as Mo in ppm, Phosphorus as P %, Calcium as Ca %, Zinc as Zn, Manganese as Mn, Potassium as K%, Nitrogen as N%, Iron as Fe%, Copper as Cu, Boron as B, Sulphurin %, Chloride as Cl%.	Five Location	Once in Six Month
10.	Noise Level Monitoring	Noise level monitoring in dB(A)	10 Location	Once in a Quarter
11.	Cooling tower	pH @ 25 ° C, Free available chlorine, Zinc as Zn, Hexavalent Chromium, Total Chromium, Phosphate	09 Location	Once in a Quarter

1.1 AMBIENT AIR QUALITY

The scenario of the Ambient Air Quality in the study region has been assessed through a network of 5locations of Ambient Air Quality Monitoring. The design of monitoring network in the air quality surveillance program was based on the following considerations.

- Topography / Terrain of the study area.
- Human Settlements
- Wind pattern
- Health status
- Representation of regional Background levels.
- Accessibility of monitoring site.
- Resource availability.

Pre-calibrated Respirable Dust Samplers (PM_{10}) & Fine Dust Samplers ($PM_{2.5}$) have been used for monitoring the existing AAQM Status. Maximum, Minimum, Average, Standard Deviation and percentile have been computed from the raw data collected at all individual sampling stations to represents the Ambient Air Quality Status.

The significant parameters viz., PM_{10}, $PM_{2.5}$, Sulphur Dioxide (SO_2) and Nitrogen Dioxides (NO_2) and Mercury were monitored within the study area of 10 km from the site.

1.2 FLUE GAS MONITORING

All three phases of the Thermal Power Plant is in operation. The flue gas emission from stack attached to individual boiler is monitored once in month during the monitoring period.

1.3 WATER QUALITY MONITORING

The water quality parameters as per IS: 10500 for water resource within the study area have been used for describing the water environment and assessing the impacts on it.

Groundwater samples of nearby villages were collected at five locations the parameters of prime importance selected under physicochemical characteristics were estimated to describe the baseline environmental status of the water resources during the monitoring period. Four bore well samples surrounding the ash dyke area were collected during the month of December 2021 along with outfall water sample.

1.4 AMBIENT NOISE LEVEL MONITORING

The Ambient Noise levels within the plant premises were relocated at a different location (10 nos.) For the implementation of effective noise control programs.

1.5 MICROMETEOROLOGY

Meteorological parameters are important factors in the study of Air Pollution. The Transport and diffusion of the pollutants in the atmosphere are governed by meteorological factors.

Primary / Basic Meteorological Parameters

- Wind Velocity
- Wind Direction

Since the dispersion and diffusion of pollutants mainly depend on the above factors hence these factors are considered as primary meteorological parameters.

Secondary Meteorological Parameters

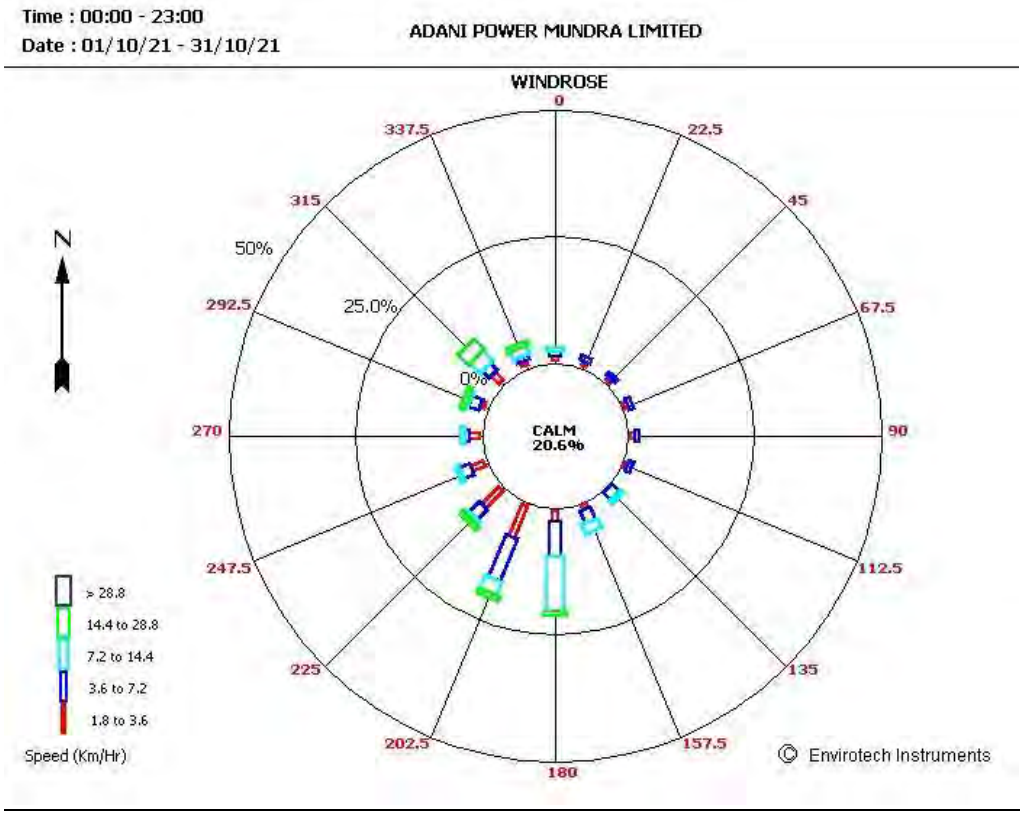
- Relative Humidity
- Ambient Temperature

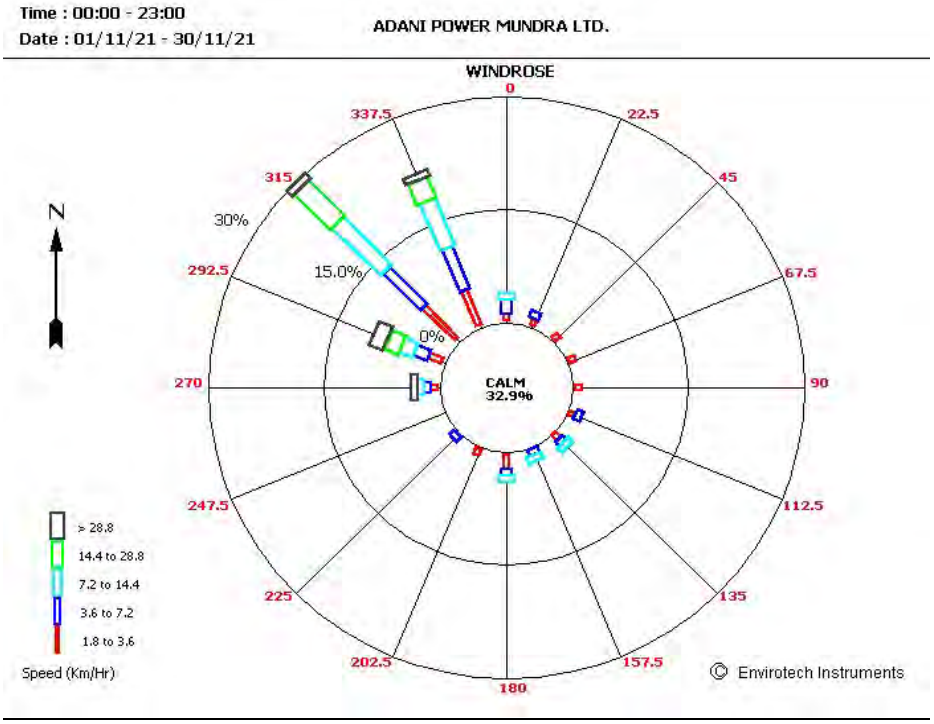
The above-said factors are considered as secondary factors since these factors control the dispersion of the pollutant indirectly by affecting the primary factors.

1.5.1 Wind Rose Diagram

Project	:	**Adani Power (Mundra) Limited (APMuL)**	**Period**	**:**	October 2021 to December 2021
Location	:	**Village – Tunda, Dist. - Kutch**			
October 2021					
Wind Direction			**S**		
Average Wind Speed			**18.6 km/hr**		
November 2021					
Wind Direction			**NW**		
Average Wind Speed			**31.7 km/hr**		
December 2021					
Wind Direction			**NW**		
Average Wind Speed			**14.6 km/hr**		

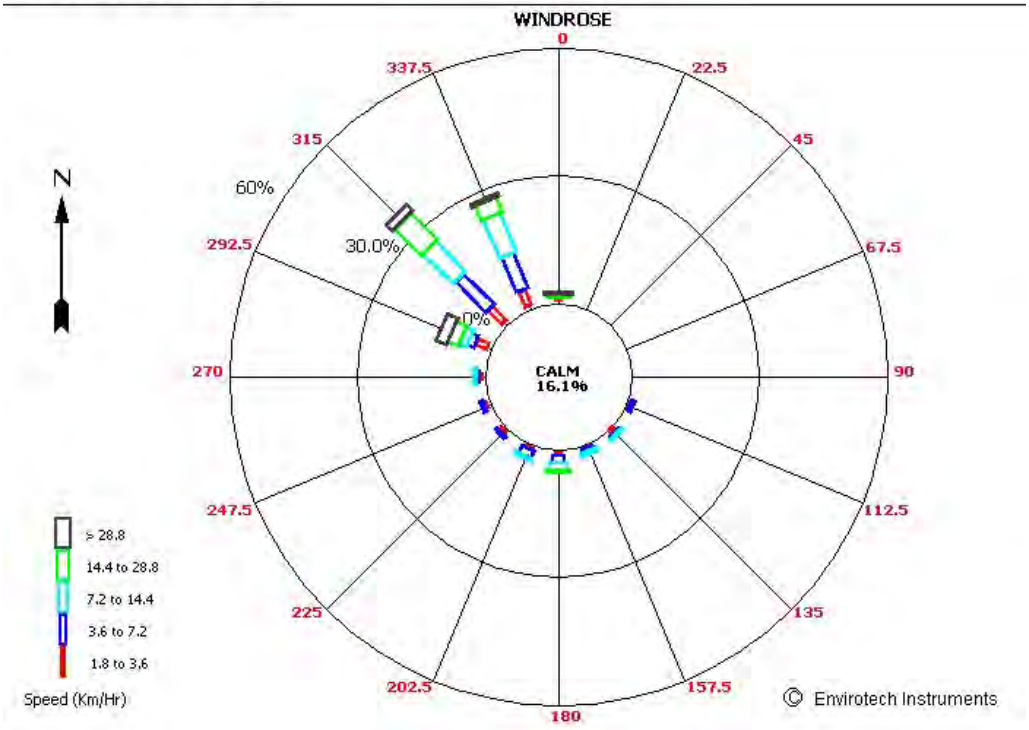
ADANI POWER (MUNDRA) LIMITED – MUNDRA WINDROSE FOR THE SEASON OF Oct. to Dec. 2021





Time : 00:00 - 23:00
Date : 01/12/21 - 31/12/21

ADANI POWER MUNDRA LTD



2 SCOPE & METHODOLOGY ADOPTED FOR ENVIRONMENTAL MONITORING

2.1 Introduction

The scope of the study includes detailed characterization of various environmental like air, water and noise within an area of 10 km radius in and around the power plant area at 20 MLD Plant, Shantiniketan-1 and surrounding villages named as Siracha, Wandh and Kandagara of Dist. Kutch.

The above-mentioned environmental components were monitored at the study area and frequency of monitoring, number of samples along with methodology is as shown in below table.

2.2 Scope and Methodology for Monitoring of Various Environmental Attributes

Sr. No	Environmental Attributes	Sampling Locations	Sampling Parameters	Sampling Frequency	Total No of samples	Methodology
1	Ambient Air Quality	3	PM_{10}, $PM_{2.5}$, SO_2, NO_2	Twice a week (24 hourly Samples)	72	IS : 5182 & Reference APHA(AIR)
2	Ambient Air Quality	5	PM_{10}, $PM_{2.5}$, SO_2, NO_2, O_3, Mercury	Once in month (24 hourly Samples)	15	IS : 5182 & Reference APHA(AIR)
2	Flue Gas Stack Analysis	Unit 1 to 9 Boiler	PM, SO_2, NOx	Once in month	27	As per IS : 11255
3	Surrounding Villages Ground Water Analysis	5 water sample	Test specification as per IS : 10500 - 1991	Once in Quarter	5	AS per APHA Method
4	Water Quality of Outfall for APMuL	1	As per CTO	Once in month	3	As Per APHA Method
5	STP Outlet	1	As per CTO	Once in month	3	As Per APHA Method
6	Bore well water Near Ash Dyke Area	4	Test specification as per IS : 10500 - 1991	Once in Quarter	4	As Per APHA Method
7	Cooling Tower Blow down Water Sample	9	As per CTO	Once in Quarter	9	As Per APHA Method
8	Condensate Cooling Tower Water Sample	9	As per CTO	Once in Quarter	9	As Per APHA Method
9	Boiler Blow down Water Sample	9	As per CTO	Once in Quarter	9	As Per APHA Method

3 ENVIRONMENAT AIR QUALITY AND FLUE GAS MONITORING

The principle objective of the ambient air quality was to assess the existing levels of the air pollution as well as the regional background concentration in the plant area. Air pollution forms important and critical factors to study the environmental issues in the study areas. Thus, air quality has to be frequently monitored to know the extent of pollution due to power plant activity and other ancillary activities. Details are provided in Section 3.1.1.

Flue gas monitoring analysis has been conducted by UniStar Environment and Research Labs Pvt. Ltd. Details are provided in Section 3.2.

3.1 Ambient Air Monitoring Data

3.1.1 Details of Ambient Air Quality Monitoring Stations

The detail of the ambient air monitoring locations including the distance from the project site with direction is as shown below.

S.No.	Code	Name of sampling location	Distance
1	A - 1	Nr.20 MLD Plant	1.2 Km
2	A - 2	Nr. Shantiniketan-1	0.8 Km
3	A - 3	Kandagara Village	3.2 km (NW)
4	A - 4	Siracha Village	2.6 km (NE)
5	A - 5	Wandh Village	2.0 km (SW)

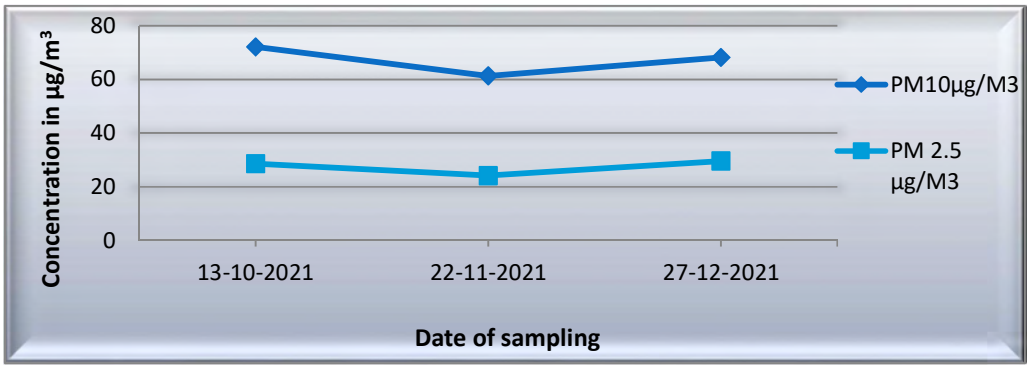
3.1.2 Location: Nr.20 MLD Plant

The Sampling station was located in the core zone in Company premises. The Respirable Dust Sampler (PM_{10}) & ($PM_{2.5}$) Sampler were placed at a height of 3 m above the ground level. Assess present pollution level the observed levels of PM_{10}, $PM_{2.5}$, SO_2, NO_2 and O_3 collected during monitoring period (Oct. 2021- Dec. 2021) are as follows:

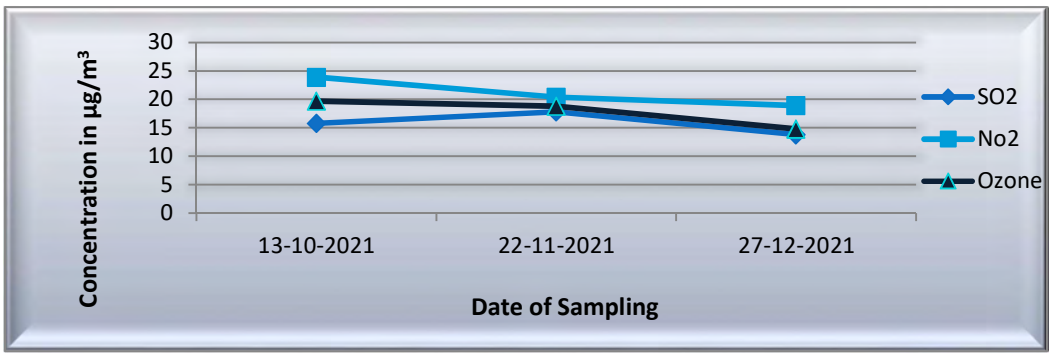
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	**72.1**	**29.6**	**17.8**	**23.9**	**19.7**
Minimum Value	**61.3**	**24.2**	**13.8**	**18.9**	**14.8**
Average Value	**67.2**	**27.5**	**15.8**	**21.1**	**17.7**
Standard Deviation	**5.5**	**2.9**	**2.0**	**2.6**	**2.6**
Permissible Limits	**100**	**60**	**80**	**80**	**100**

Units: $\mu g/m^3$

Graph 1 : Particulate Matter Level Nr.20 MLD Plant



Graph 2: SO2, NO2 and O_3 Nr.20 MLD Plant



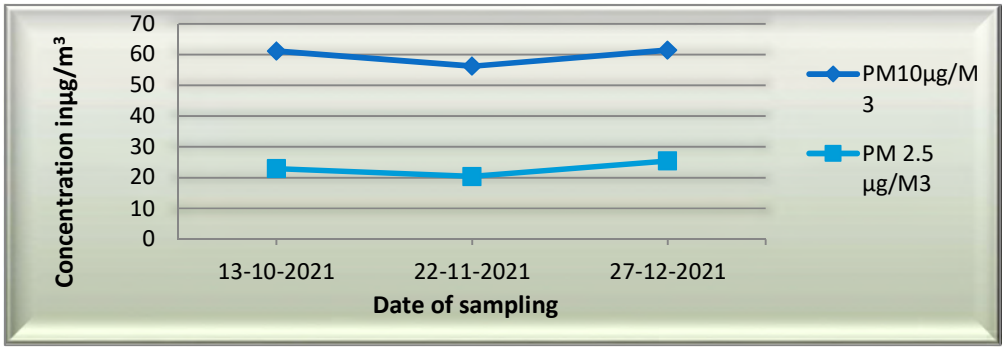
3.1.3 Location: Nr. Shantiniketan-1

The Sampling station was located in the core zone in company premises. The Respirable Dust SamplerPM_{10} & $PM_{2.5}$Sampler were placed at a height of 3 m above the ground level. The observed levels of PM_{10}, $PM_{2.5}$, SO_2, NO_2 and O_3 collected during monitoring period (Oct. 2021- Dec. 2021) are as follows

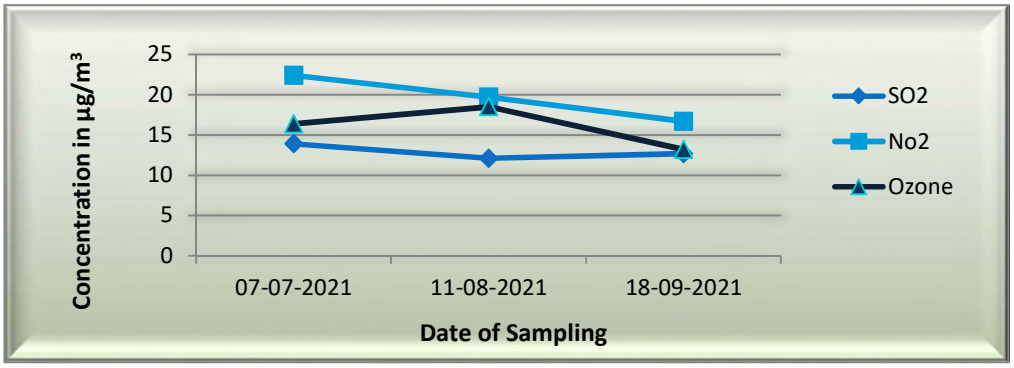
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	**61.4**	**25.4**	**13.4**	**21.1**	**16.7**
Minimum Value	**56.2**	**20.4**	**12.6**	**16.7**	**13.2**
Average Value	**59.6**	**22.9**	**12.9**	**19.0**	**15.1**
Standard Deviation	**2.9**	**2.5**	**0.4**	**2.2**	**1.7**
Permissible Limits	**100**	**60**	**80**	**80**	**100**

Units: $\mu g/m^3$

Graph 3: Particulate Matter Level Nr. Shantiniketan-1



Graph 4 : SO2, NO2 and O_3 Nr. Shantiniketan-1



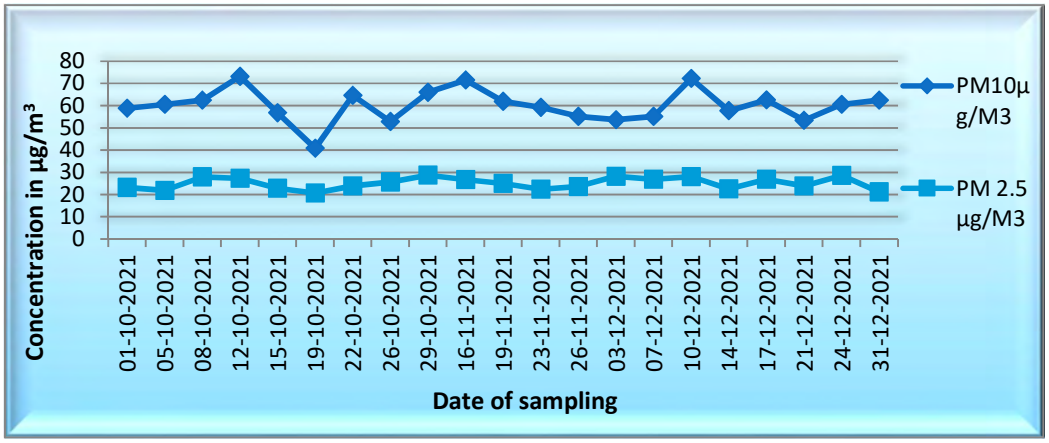
3.1.4 Location: Kandagara Village

The Sampling station was located in the core zone. The Station is located at about 3 km away in Northwest Direction from the Company premises. The Respirable Dust Sampler (PM_{10}) & $PM_{2.5}$Sampler were placed at a height of 2.5 m above the ground level. The observed levels of PM_{10}, $PM_{2.5}$, SO_2, NO_2 and O_3 collected during the monitoring period (Oct. 2021- Dec. 2021) are as follows.

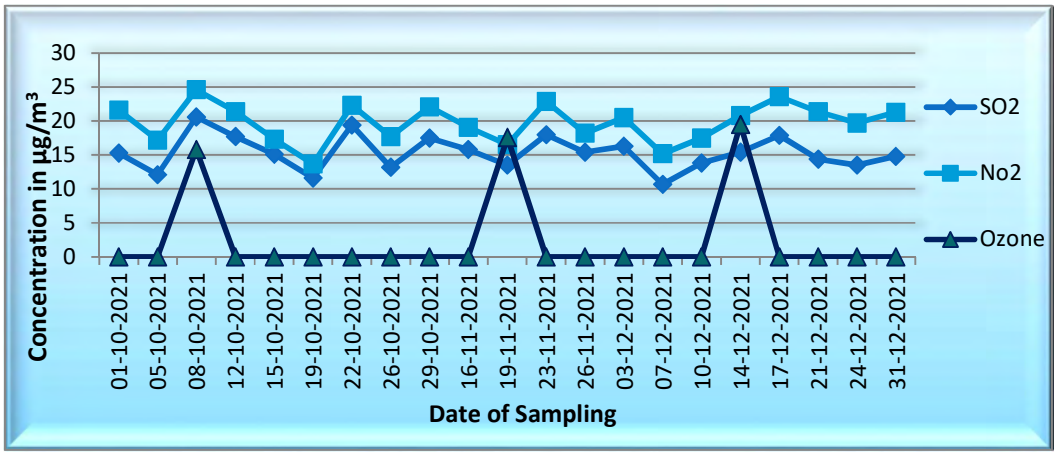
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	**73.2**	**28.7**	**20.6**	**24.6**	**17.6**
Minimum Value	**40.8**	**20.6**	**10.7**	**13.7**	**15.8**
Average Value	**60.1**	**25.0**	**15.3**	**19.7**	**16.7**
Standard Deviation	**7.4**	**2.6**	**2.6**	**2.9**	**1.2**
Permissible Limits	**100**	**60**	**80**	**80**	**100**

Units: µg/m^3

Graph 5: Particulate Matter Level Kandagara Village



Graph 6 : SO2, NO2 and O_3 Level Kandagara Village



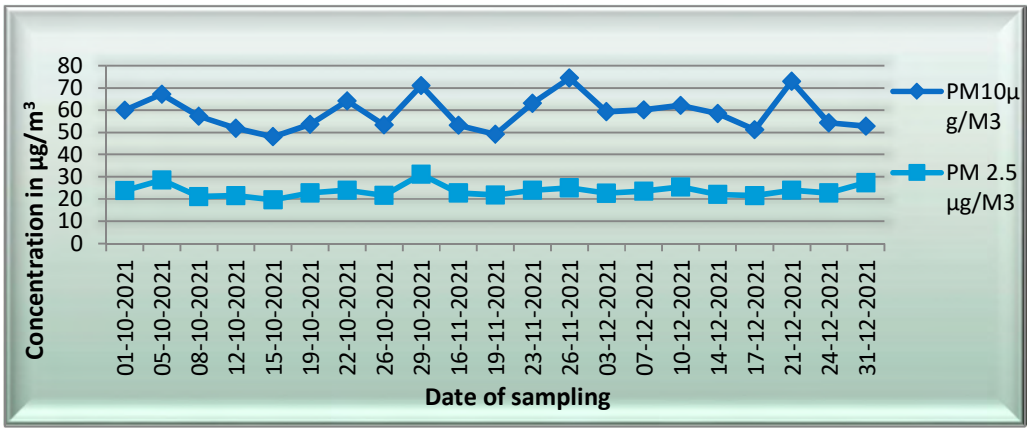
3.1.5 Location: Siracha Village

The Sampling station was located in the Siracha village. The Station is located at about 3.5 km away in Northwest Direction from the core zone area. The Respirable Dust Sampler & $PM_{2.5}$ was placed at a height of 3.0 m above the ground level. The observed levels of PM_{10}, $PM_{2.5}$, SO_2, NO_2 and O_3 collected during the monitoring period (Oct. 2021- Dec. 2021) are as follows.

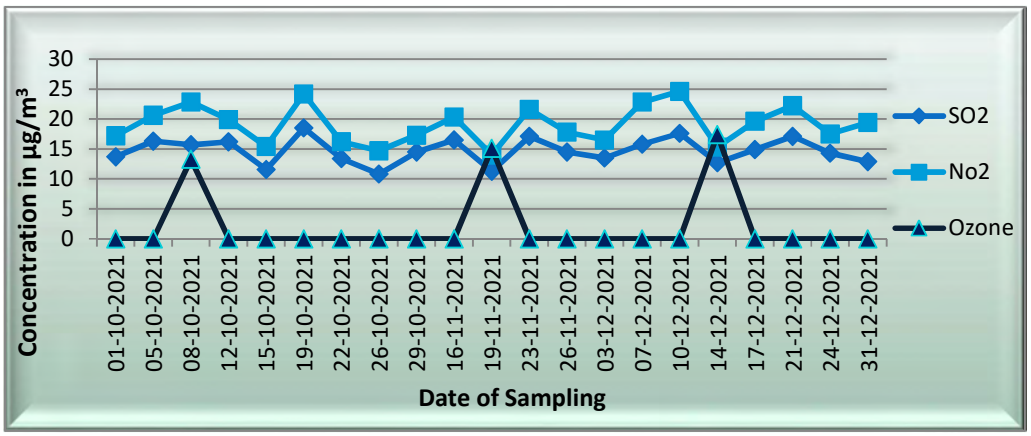
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	74.4	31.1	18.5	24.6	15.1
Minimum Value	48	19.6	10.8	14	13.3
Average Value	58.9	23.7	14.7	19.0	14.2
Standard Deviation	7.7	2.7	2.2	3.2	1.2
Permissible Limits	100	60	80	80	100

Units: $\mu g/m^3$

Graph 7 : Particulate Matter Level Siracha Village



Graph 8 : SO_2, NO_2 and O_3 Level Siracha Village



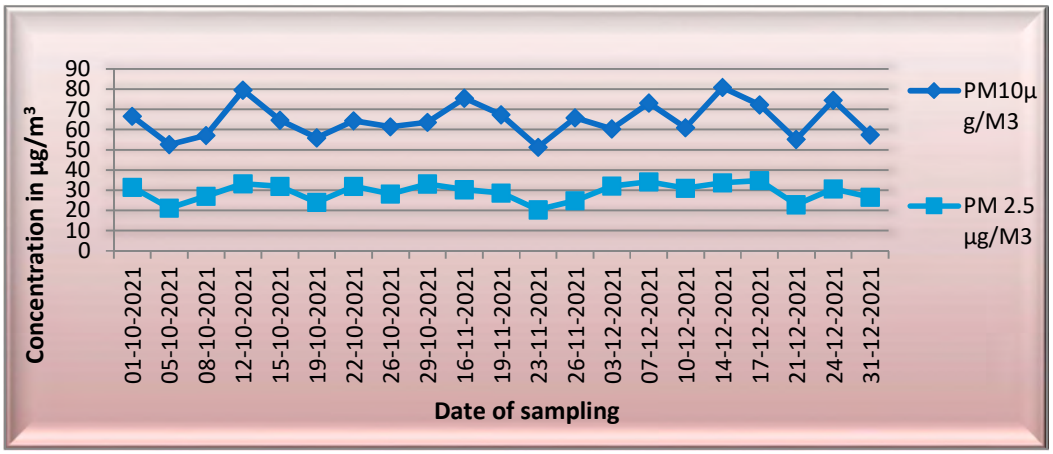
3.1.6 Location: Wandh Village

The Sampling station was located in the core zone in Wandh village. The Station is located at about 3.0 km away in Southwest Direction from the Company premises. The Respirable Dust Sampler Was placed at a height of 3.0 m above the ground level. The observed levels of PM_{10}, $PM_{2.5}$, SO_2, NO_2 and O_3 collected during the monitoring period (Oct. 2021- Dec. 2021) are as follows.

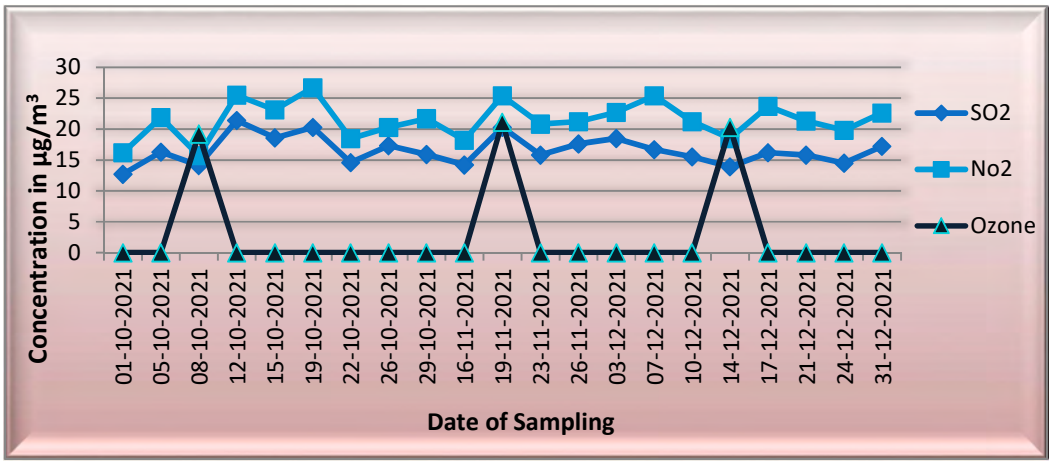
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	**80.9**	**34.8**	**21.4**	**26.7**	**21.1**
Minimum Value	**51.3**	**20.4**	**12.7**	**15.7**	**19.2**
Average Value	**64.8**	**29.2**	**16.5**	**21.4**	**20.15**
Standard Deviation	**8.6**	**4.4**	**2.3**	**3.0**	**1.3**
Permissible Limits	**100**	**60**	**80**	**80**	**100**

Units: $\mu g/m^3$

Graph 9 : Particulate Matter Level Wandh Village



Graph 10 : SO_2, NO_2 and O_3 Level Wandh Village



3.1.7 Ambient Air Quality Monitoring (Parameters- Mercury & Ozone)

Location	October-2021			November-2021			December-2021		
	Date	**Ozone (O3) µg/m3**	**Mercury (Hg) µg/m3**	**Date**	**Ozone (O3) µg/m3**	**Mercury (Hg) µg/m3**	**Date**	**Ozone (O3) µg/m3**	**Mercury (Hg) µg/m3**
Village Kandagara	**08.10.21**	15.8	BDL	**19.11.21**	17.6	BDL	**14.12.21**	19.5	BDL
Village Wandh	**08.10.21**	19.2	BDL	**19.11.21**	21.1	BDL	**14.12.21**	20.3	BDL
Village Siracha	**08.10.21**	13.3	BDL	**19.11.21**	15.1	BDL	**14.12.21**	17.4	BDL
Nr. 20 MLD Plant	**13.10.21**	19.7	BDL	**22.11.21**	18.8	BDL	**27.12.21**	14.8	BDL
Nr. Shantiniketan-1	**13.10.21**	16.7	BDL	**22.11.21**	15.4	BDL	**27.12.21**	13.2	BDL

Remark**: Calibrated equipment & instruments were used during monitoring & analysis of above identified sample.**

Analysis Method Reference :

Hg : AAS by VGA Method -3112 B APHA 22 Edition : BDL Limit Hg **: 2 ppb**

O_3 : IS - 5182 (part 9) 2009 Ozone BDL limit: 5 µg/m^3

3.2 Flue Gas Monitoring Data

Stack monitoring has been carried out by UniStar environment & Research Pvt. Ltd.

Date	Location	PM in mg/Nm^3	SO_2 in mg/Nm^3	NO_x in mg/Nm^3
27-11-2021	Boiler (Unit - 1)	30.1	478.4	268.4
28-12-2021	Boiler (Unit - 1)	30.1	511.2	282.4
28-12-2021	Boiler (Unit - 2)	27.9	534.3	296.1
26-10-2021	Boiler (Unit - 3)	31.3	462.3	277.1
30-11-2021	Boiler (Unit - 3)	40.8	433.7	246.4
06-12-2021	Boiler (Unit - 3)	33.6	564.2	287.4
26-10-2021	Boiler (Unit - 4)	28.8	488.5	245.1
15-11-2021	Boiler (Unit - 4)	39.4	459.6	263.8
06-12-2021	Boiler (Unit - 4)	32.8	531.6	279.6
09-10-2021	Boiler (Unit - 5)	36.8	514.2	266.7
01-11-2021	Boiler (Unit - 5)	34.2	458.3	253.6
09-10-2021	Boiler (Unit - 6)	40.1	556.1	255.4
01-11-2021	Boiler (Unit - 6)	35.4	473.4	276.3
Permissible Limits		**50**	**<500 MWH-600** **>500 MWH-200**	**450**

3.3 Water Quality Monitoring

3.3.1 Location: Tunda Village Water Sample **DATE: 15/12/2021**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.39	6.5 – 8.5	6.5 – 8.5
2	Color	Pt-Co	10	5	15
3	Odor	mg/L	Agreeable	Unobjectionable	Unobjectionable
4	Taste	mg/L	Agreeable	Agreeable	Agreeable
5	Turbidity(NTU)	mg/L	BDL(MDL:0.1)	1 NTU	5 NTU
6	Total Hardness as $CaCO_3$	mg/L	128.3	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	26.5	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	15.1	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1260	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	331.6	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	453.9	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	154.6	200 mg/lit.	400 mg/lit.
13	Nitrate as NO_3	mg/L	3.6	45 mg/lit.	45 mg/lit.
14	Copper as Cu	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	1.5 mg/lit.
15	Manganese as Mn	mg/L	BDL(MDL:0.1)	0.1 mg/lit.	0.3 mg/lit.
16	Iron as Fe	mg/L	BDL(MDL:0.1)	0.3 mg/lit.	0.3 mg/lit.
17	Residual Free Chlorine	mg/L	0.26	0.2 mg/lit.	1.0 mg/lit.
18	Fluoride as F	mg/L	0.54	1.0 mg/lit.	1.5 mg/lit.
19	Zinc as Zn	mg/L	BDL(MDL:0.05)	5 mg/lit.	15 mg/lit.
20	Phenolic Compound	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.002 mg/lit.
21	Mercury as Hg	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.001 mg/lit.
22	Cadmium as Cd	mg/L	BDL(MDL:0.003)	0.003 mg/lit.	0.003 mg/lit.
23	Selenium as Se	mg/L	N.D.	0.01 mg/lit.	0.01 mg/lit.
24	Arsenic as as	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	0.05 mg/lit.
25	Cyanide as CN	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
26	Lead as Pb	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	0.01 mg/lit.
27	Anionic Detergent	mg/L	N.D.	0.2 mg/lit.	1.0 mg/lit.
28	Hexavalent Chromium	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
29	Mineral Oil	mg/L	N.D.	0.5 mg/lit.	0.5 mg/lit.
30	Aluminum as Al	mg/L	BDL(MDL:0.003)	0.03 mg/lit.	0.2 mg/lit.
31	Boron as B	mg/L	BDL(MDL:0.5)	0.5 mg/lit.	1 mg/lit.
32	Total Chromium as Cr	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
33	Total Coliform	(CFU/100 ml)	Absent	Absent	Absent
34	E. coli	(CFU/100 ml)	Absent	Absent	Absent
35	Total Bacterial Count	(CFU/ml)	14	100 CFU/ml	100 CFU/ml
Note: BDL= Below Detection Limit. N.D. = Not Detected					

3.3.2 Location: Kandagra Village Water Sample **DATE: 15/12/2021**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.36	6.5 – 8.5	6.5 – 8.5
2	Color	Pt-Co	10	5	15
3	Odor	mg/L	Agreeable	Unobjectionable	Unobjectionable
4	Taste	mg/L	Agreeable	Agreeable	Agreeable
5	Turbidity(NTU)	mg/L	BDL(MDL:0.1)	1 NTU	5 NTU
6	Total Hardness as $CaCO_3$	mg/L	118.3	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	22.5	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	15.1	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1172	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	321.6	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	353.9	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	114.6	200 mg/lit.	400 mg/lit.
13	Nitrate as NO_3	mg/L	2.9	45 mg/lit.	45 mg/lit.
14	Copper as Cu	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	1.5 mg/lit.
15	Manganese as Mn	mg/L	BDL(MDL:0.1)	0.1 mg/lit.	0.3 mg/lit.
16	Iron as Fe	mg/L	BDL(MDL:0.1)	0.3 mg/lit.	0.3 mg/lit.
17	Residual Free Chlorine	mg/L	0.33	0.2 mg/lit.	1.0 mg/lit.
18	Fluoride as F	mg/L	0.79	1.0 mg/lit.	1.5 mg/lit.
19	Zinc as Zn	mg/L	BDL(MDL:0.05)	5 mg/lit.	15 mg/lit.
20	Phenolic Compound	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.002 mg/lit.
21	Mercury as Hg	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.001 mg/lit.
22	Cadmium as Cd	mg/L	BDL(MDL:0.003)	0.003 mg/lit.	N.D.(MDL:0.001)
23	Selenium as Se	mg/L	N.D.	0.01 mg/lit.	N.D.
24	Arsenic as as	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	N.D.(MDL:0.01)
25	Cyanide as CN	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	N.D.
26	Lead as Pb	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	N.D.(MDL:0.003)
27	Anionic Detergent	mg/L	N.D.	0.2 mg/lit.	N.D.
28	Hexavalent Chromium	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	N.D.(MDL:0.1)
29	Mineral Oil	mg/L	N.D.	0.5 mg/lit.	N.D.
30	Aluminum as Al	mg/L	BDL(MDL:0.003)	0.03 mg/lit.	N.D.
31	Boron as B	mg/L	BDL(MDL:0.5)	0.5 mg/lit.	N.D.
32	Total Chromium as Cr	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	N.D.(MDL:0.001)
33	Total Coliform	(CFU/100 ml)	Absent	Absent	Absent
34	E. coli	(CFU/100 ml)	Absent	Absent	Absent
35	Total Bacterial Count	(CFU/ml)	10	100 CFU/ml	100 CFU/ml

Note: BDL= Below Detection Limit. N.D. = Not Detected

3.3.3Location: Siracha Village Water Sample **DATE: 15/12/2021**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.28	6.5 – 8.5	6.5 – 8.5
2	Color	Pt-Co	10	5	15
3	Odour	mg/L	Agreeable	Unobjectionable	Unobjectionable
4	Taste	mg/L	Agreeable	Agreeable	Agreeable
5	Turbidity(NTU)	mg/L	BDL(MDL:0.1)	1 NTU	5 NTU
6	Total Hardness as $CaCO_3$	mg/L	308.2	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	58.3	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	48.8	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1118	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	385.6	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	341	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	184.2	200 mg/lit.	400 mg/lit.
13	Nitrate as NO_3	mg/L	3.5	45 mg/lit.	45 mg/lit.
14	Copper as Cu	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	1.5 mg/lit.
15	Manganese as Mn	mg/L	BDL(MDL:0.1)	0.1 mg/lit.	0.3 mg/lit.
16	Iron as Fe	mg/L	BDL(MDL:0.1)	0.3 mg/lit.	0.3 mg/lit.
17	Residual Free Chlorine	mg/L	0.32	0.2 mg/lit.	1.0 mg/lit.
18	Fluoride as F	mg/L	0.66	1.0 mg/lit.	1.5 mg/lit.
19	Zinc as Zn	mg/L	BDL(MDL:0.05)	5 mg/lit.	15 mg/lit.
20	Phenolic Compound	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.002 mg/lit.
21	Mercury as Hg	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.001 mg/lit.
22	Cadmium as Cd	mg/L	BDL(MDL:0.003)	0.003 mg/lit.	0.003 mg/lit.
23	Selenium as Se	mg/L	N.D.	0.01 mg/lit.	0.01 mg/lit.
24	Arsenic as as	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	0.05 mg/lit.
25	Cyanide as CN	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
26	Lead as Pb	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	0.01 mg/lit.
27	Anionic Detergent	mg/L	N.D.	0.2 mg/lit.	1.0 mg/lit.
28	Hexavalent Chromium	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
29	Mineral Oil	mg/L	N.D.	0.5 mg/lit.	0.5 mg/lit.
30	Aluminum as Al	mg/L	BDL(MDL:0.003)	0.03 mg/lit.	0.2 mg/lit.
31	Boron as B	mg/L	BDL(MDL:0.5)	0.5 mg/lit.	1 mg/lit.
32	Total Chromium as Cr	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
33	Total Coliform	(CFU/100 ml)	Absent	Absent	Absent
34	E. coli	(CFU/100 ml)	Absent	Absent	Absent
35	Total Bacterial Count	(CFU/ml)	08	100 CFU/ml	100 CFU/ml

Note: BDL= Below Detection Limit. N.D. = Not Detected

3.3.4 Location: Navinal Village Water Sample **DATE: 15/12/2021**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.52	6.5 – 8.5	6.5 – 8.5
2	Colour	Pt-Co	10	5	15
3	Odour	mg/L	Agreeable	Unobjectionable	Unobjectionable
4	Taste	mg/L	Agreeable	Agreeable	Agreeable
5	Turbidity(NTU)	mg/L	BDL(MDL:0.1)	1 NTU	5 NTU
6	Total Hardness as $CaCO_3$	mg/L	151.3	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	35.0	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	15.6	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1104	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	216.0	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	334.0	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	98.6	200 mg/lit.	400 mg/lit.
13	Nitrate as NO_3	mg/L	2.3	45 mg/lit.	45 mg/lit.
14	Copper as Cu	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	1.5 mg/lit.
15	Manganese as Mn	mg/L	BDL(MDL:0.1)	0.1 mg/lit.	0.3 mg/lit.
16	Iron as Fe	mg/L	BDL(MDL:0.1)	0.3 mg/lit.	0.3 mg/lit.
17	Residual Free Chlorine	mg/L	0.24	0.2 mg/lit.	1.0 mg/lit.
18	Fluoride as F	mg/L	0.48	1.0 mg/lit.	1.5 mg/lit.
19	Zinc as Zn	mg/L	BDL(MDL:0.05)	5 mg/lit.	15 mg/lit.
20	Phenolic Compound	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.002 mg/lit.
21	Mercury as Hg	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.001 mg/lit.
22	Cadmium as Cd	mg/L	BDL(MDL:0.003)	0.003 mg/lit.	0.003 mg/lit.
23	Selenium as Se	mg/L	N.D.	0.01 mg/lit.	0.01 mg/lit.
24	Arsenic as as	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	0.05 mg/lit.
25	Cyanide as CN	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
26	Lead as Pb	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	0.01 mg/lit.
27	Anionic Detergent	mg/L	N.D.	0.2 mg/lit.	1.0 mg/lit.
28	Hexavalent Chromium	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
29	Mineral Oil	mg/L	N.D.	0.5 mg/lit.	0.5 mg/lit.
30	Aluminum as Al	mg/L	BDL(MDL:0.003)	0.03 mg/lit.	0.2 mg/lit.
31	Boron as B	mg/L	BDL(MDL:0.5)	0.5 mg/lit.	1 mg/lit.
32	Total Chromium as Cr	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
33	Total Coliform	(CFU/100 ml)	Absent	Absent	Absent
34	E. coli	(CFU/100 ml)	Absent	Absent	Absent
35	Total Bacterial Count	(CFU/ml)	12	100 CFU/ml	100 CFU/ml

Note: BDL= Below Detection Limit. N.D. = Not Detected

3.3.5Location: Desalpur Village Water Sample **DATE: 15/12/2021**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.46	6.5 – 8.5	6.5 – 8.5
2	Color	Pt-Co	10	5	15
3	Odor	mg/L	Agreeable	Unobjectionable	Unobjectionable
4	Taste	mg/L	Agreeable	Agreeable	Agreeable
5	Turbidity(NTU)	mg/L	BDL(MDL:0.1)	1 NTU	5 NTU
6	Total Hardness as $CaCO_3$	mg/L	102.8	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	23.3	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	10.8	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1054	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	302.4	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	398	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	124.6	200 mg/lit.	400 mg/lit.
13	Nitrate as NO_3	mg/L	3	45 mg/lit.	45 mg/lit.
14	Copper as Cu	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	1.5 mg/lit.
15	Manganese as Mn	mg/L	BDL(MDL:0.1)	0.1 mg/lit.	0.3 mg/lit.
16	Iron as Fe	mg/L	BDL(MDL:0.1)	0.3 mg/lit.	0.3 mg/lit.
17	Residual Free Chlorine	mg/L	0.24	0.2 mg/lit.	1.0 mg/lit.
18	Fluoride as F	mg/L	0.44	1.0 mg/lit.	1.5 mg/lit.
19	Zinc as Zn	mg/L	BDL(MDL:0.05)	5 mg/lit.	15 mg/lit.
20	Phenolic Compound	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.002 mg/lit.
21	Mercury as Hg	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.001 mg/lit.
22	Cadmium as Cd	mg/L	BDL(MDL:0.003)	0.003 mg/lit.	0.003 mg/lit.
23	Selenium as Se	mg/L	N.D.	0.01 mg/lit.	0.01 mg/lit.
24	Arsenic as as	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	0.05 mg/lit.
25	Cyanide as CN	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
26	Lead as Pb	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	0.01 mg/lit.
27	Anionic Detergent	mg/L	N.D.	0.2 mg/lit.	1.0 mg/lit.
28	Hexavalent Chromium	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
29	Mineral Oil	mg/L	N.D.	0.5 mg/lit.	0.5 mg/lit.
30	Aluminum as Al	mg/L	BDL(MDL:0.003)	0.03 mg/lit.	0.2 mg/lit.
31	Boron as B	mg/L	BDL(MDL:0.5)	0.5 mg/lit.	1 mg/lit.
32	Total Chromium as Cr	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
33	Total Coliform	(CFU/100 ml)	Absent	Absent	Absent
34	E. coli	(CFU/100 ml)	Absent	Absent	Absent
35	Total Bacterial Count	(CFU/ml)	10	100 CFU/ml	100 CFU/ml

Note: Colour = 1(10) = 10 APHA, BDL= Below Detection Limit. N.D. = Not Detected

3.4 Water Quality Monitoring – Plant area

3.4.1 Location: STP Outlet Water Sample;

Sr. No.	Parameter	Unit	SPCB Limit	Date of sampling		
				09/10/2021	**23/11/2021**	**15/12/2021**
1	pH @ 25 ° C	--	**6.5-8.5**	7.38	7.43	7.39
2	Total Suspended Solids	mg/L	**30**	18	22	20
3	Residual Chlorine	mg/L	**0.5 Min.**	0.60	0.72	0.69
4	Biochemical Oxygen Demand (BOD)	mg/L	**20**	12	14	12
5	Fecal Coliform	CFU/100ml	**<1000**	46	48	48

3.4.2 Location: ETP Outlet Water Sample;

S.N	Parameter	Unit	SPCB Limit	Date of sampling	
				09/10/2021	**23/11/2021**
1	pH @ 25	--	**6.5 – 8.5**	7.43	7.40
2	Temperature	° C	**40 Max.**	28	28
3	Color	Pt. CO. Scale	**100 Max.**	25	20
4	Total Suspended Solids	mg/L	**100 Max.**	18	16
5	Oil & Grease	mg/L	**10 Max.**	BDL(MDL:2.0)	BDL(MDL:2.0)
6	Chemical Oxygen Demand (COD)	mg/L	**100 Max.**	39.2	43.1
7	Biochemical Oxygen Demand (BOD)	mg/L	**30 Max.**	12	13
8	Chloride as Cl^-	mg/L	**600 Max.**	362.1	376.2
9	Total Dissolved Solids	mg/L	**2100 Max.**	1570	1600
10	Sulphate as SO_4	mg/L	**1000 Max.**	96.3	99.1
11	Ammonical Nitrogen	mg/L	**50 Max.**	BDL(MDL:2.0)	BDL(MDL:2.0)
12	% Sodium(Na)	mg/L	**60 Max.**	49.6	50.1
13	Sodium Absorption Ratio(SAR)	mg/L	**26 Max.**	1.8	2.0
14	Sulphide as S^{-2}	mg/L	**02 Max.**	BDL(MDL:0.05)	BDL(MDL:0.05)
15	Total Chromium	mg/L	**02 Max.**	BDL(MDL:0.05)	BDL(MDL:0.05)
16	Hexavalent Chromium as Cr+6	mg/L	**0.1 Max.**	BDL(MDL:0.05)	BDL(MDL:0.05)
17	Phosphate as PO_4	mg/L	**5.0 Max.**	0.35	0.37
18	Copper as Cu	mg/L	**03 Max.**	BDL(MDL:0.05)	BDL(MDL:0.05)
19	Lead as Pb	mg/L	**0.1 Max.**	BDL(MDL:0.01)	BDL(MDL:0.01)
20	Zinc as Zn	mg/L	**05 Max.**	BDL(MDL:0.05)	BDL(MDL:0.05)
21	Residual Free Chlorine	mg/L	**0.5 Max.**	BDL(MDL:0.2)	BDL(MDL:0.2)
22	Iron (as Fe)	mg/L	**1.0 Max.**	BDL(MDL:0.1)	BDL(MDL:0.1)

Note: N.D. = Not Detected, **MDL** = Minimum Detection Limit

3.4.3 Location: Bore-well – 1 to 4 (Nr. Emergency Ash Pond) **Date: 15/12/2021**

Sr.No.	Parameter	Unit	Results			
			Borewell-1	**Borewell-2**	**Borewell-3**	**Borewell-4**
1	pH @ 25 ° C	-	7.59	7.56	7.59	7.41
2	Conductivity (µS)	-	15250	17320	15250	15690
3	Total Dissolved Solids	mg/L	9760	11088	9764	10274
4	Chloride as Cl^-	mg/L	4649	4450	4323.5	4463.2
5	Carbonate as CaCO3	mg/L	21.3	26.0	31.5	28.8
6	Bicarbonate as CaCO3	mg/L	207.3	208.6	160.5	185.5
7	Total Alkalinity	mg/L	370	410.4	334.4	431.2
8	Calcium as Ca	mg/L	328.9	322.4	292.0	378.8
9	Magnesium as Mg	mg/L	229.4	201.6	153.4	216.3
10	Sodium as Na	mg/L	1476	1982	1202	1576
11	Potassium as K	mg/L	82.40	118.6	64.6	86.4
12	Sulphate as SO4-2	mg/L	586	792	592.8	690.8
13	Nitrate as NO3	mg/L	27	29	23.6	28.11
14	Phosphate as PO_4	mg/L	3	3.02	2.12	2.26
15	Fluoride as F	mg/L	2.5	2.38	2.1	2.62
16	Mercury as Hg	mg/L	BDL(MDL:0.001)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)
17	Arsenic as As	mg/L	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)
18	Lead as Pb	mg/L	BDL(MDL:0.01)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
19	Chromium as Cr	mg/L	BDL(MDL:0.05)	BDL(MDL:0.003)	BDL(MDL:0.003)	BDL(MDL:0.003)
20	Cadmium as Cd	mg/L	BDL(MDL:0.003)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)
21	Iron (as Fe)	mg/L	BDL(MDL:0.1)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
22	Zinc (as Zn)	mg/L	BDL(MDL:0.05)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)
23	Cobalt as Co	mg/L	BDL(MDL:0.1)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
24	Copper as Cu	mg/L	BDL(MDL:0.05)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)
25	Manganese as Mn	mg/L	BDL(MDL:0.1)	BDL(MDL:0.02)	BDL(MDL:0.02)	BDL(MDL:0.02)
26	Nickel as Ni	mg/L	BDL(MDL:0.02)	BDL(MDL:0.001)	BDL(MDL:0.001)	BDL(MDL:0.001)
27	Salinity	ppt	7.4	8.04	7.76	8.0
28	Barium as Ba	mg/L	N.D.	N.D.	N.D.	N.D.

Note: N.D. = Not Detected, **MDL** = Minimum Detection Limit

3.4.4 Location: Cooling Tower Blow down Water Sample

S.No.	Parameter	Unit	Limit	Results		
				Unit-1	Unit-3	Unit-4
	Date of Sampling ⟹			**08/12/2021**	**08/12/2021**	**08/12/2021**
1	pH @ 25 ° C	--	--	7.71	7.73	7.78
2	Free available Chlorine	° C	Min. 0.5	0.58	0.58	0.59
3	Zinc as Zn	Pt. CO. Scale	1.0	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
4	Hexavalent Chromium as Cr+6	mg/L	0.1	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
5	Total Chromium as Cr	mg/L	0.2	0.052	0.054	0.051
6	Phosphate as P	mg/L	5.0	0.33	0.39	0.38

3.4.5 Location: Condensate Cooling Tower Water Sample

S.No.	Parameter	Unit	Limit	Results		
				Unit-1	Unit-3	Unit-4
	Date of Sampling ⟹			**08/12/2021**	**08/12/2021**	**08/12/2021**
1	pH @ 25 ° C	--	**6.5 to 8.5**	7.84	7.86	7.91
2	Temperature ^{0}C (Inlet)	^{0}C	--	30.5	29.5	30.0
	Temperature ^{0}C (Outlet)	^{0}C	--	32.0	31.5	32.0
	Temperature ^{0}C (Differential)	^{0}C	**7**	1.5	2.0	2.0
3	Free available Chlorine	mg/L	**Min 0.5**	0.89	0.78	0.85

3.4.6 Location: Boiler Blow Down Water Sample DATE: 08/12/2021

Parameter	Unit	Limit	Results	
			Unit -3	Unit -4
Total Suspended Solids	mg/L	**100**	BDL(MDL:4.0)	BDL(MDL:4.0)
Oil & Grease	mg/L	**10**	BDL(MDL:2.0)	BDL(MDL:2.0)
Total Copper as Cu	mg/L	**1.0**	BDL(MDL:0.05)	BDL(MDL:0.05)
Total Iron (as Fe)	mg/L	**1.0**	BDL(MDL:0.1)	BDL(MDL:0.1)

3.5 Soil Quality Monitoring: Date: 15/12/2021

Locations of soil sampling ⇨			Kandagra	Tunda	Desalpur	Siracha	Navinal
Sr. No.	**Parameter**	**Unit**	**Results**				
1	Magnesium as Mg	%	0.0049	0.0045	0.0058	0.0049	0.0091
2	Molybdenum as Mo	%	N.D.	N.D.	N.D.	N.D.	N.D.
3	Phosphorous as P	%	0.3110	0.3376	0.2258	0.2786	0.2290
4	Calcium as Ca	%	0.034	0.030	0.016	0.033	0.020
5	Zinc as Zn	%	0.004	0.0022	0.0032	0.0023	0.0024
6	Manganese as Mn	%	0.021	0.030	0.0294	0.026	0.0257
7	Potassium as K	%	0.0048	0.0039	0.0039	0.0024	0.0032
8	Nitrogen as N	%	0.0054	0.0079	0.0092	0.0066	0.0086
9	Iron as Fe	%	0.332	0.476	0.4481	0.752	1.1376
10	Copper as Cu	%	0.0013	0.0005	0.0009	0.0004	0.0003
11	Boron as B	%	N.D.	N.D.	N.D.	N.D.	N.D.
12	Sulphur	%	0.0054	0.0079	0.0047	0.0077	0.0081
13	Chlorides as Cl	%	0.0051	0.0156	0.0160	0.0579	0.039
Note: N.D. = **Not Detected,**							

4 AMBIENT NOISE LEVEL MONITORING

The main objective of noise monitoring in the study area is to establish the baseline noise levels and assess the impact of the total noise generated by the operation activities around it. Noise monitoring has been conducted at 10 locations within the periphery of industry premises.

Date of Monitoring: 04.10.2021

Result

Sr. No.	Location	Noise Level dB(A)			
		Sampling Time	Day Time dB(A) 06 am - 10 pm	Sampling Time	Night Time dB(A) 10 pm - 06 am
			Limit 75 dB(A)		Limit 70 dB(A)
1.	Nr. LDO Pump House	11:15 am - 13:10 pm	61.5	22:05 pm - 00:15 am	59.8
2.	Nr. 20 MLD Plant		62.8		60.8
3.	Nr. Pump House		61.2		59.7
4.	Nr. Coal Handling plant		66.0		62.7
5.	Nr. Gate No.4		57.0		54.0
6.	Nr. Integrated Ash Silo		63.8		62.6
7.	Nr. Main Gate		57.8		56.5
8.	Nr. APCH Building		59.9		56.9
9.	Nr. Shantiniketan-I		58.5		55.4
10.	Nr. OHC Building		59.7		56.1

Remark: Calibrated instruments were used during monitoring of above identified sample.

Date of Monitoring: 23-24.11.2021

Result

Sr. No.	Location	Noise Level dB(A)			
		Sampling Time	Day Time dB(A) 06 am - 10 pm	Sampling Time	Night Time dB(A) 10 pm - 06 am
			Limit 75 dB(A)		Limit 70 dB(A)
1.	Nr. LDO Pump House	11:15 am - 13:10 pm	61.2	22:05 pm - 00:15 am	**60.9**
2.	Nr. 20 MLD Plant		64.5		**62.2**
3.	Nr. Pump House		65.8		**61.7**
4.	Nr. Coal Handling plant		64.1		**62.7**
5.	Nr. Gate No.4		56.8		**54.0**
6.	Nr. Integrated Ash Silo		65.4		**62.6**
7.	Nr. Main Gate		62.4		**62.1**
8.	Nr. APCH Building		57.8		**56.8**
9.	Nr. Shantiniketan-I		59.9		**59.2**
10.	**Nr. OHC Building**		**58.5**		57.9

Remark: Calibrated instruments were used during monitoring of above identified sample.

Date of Monitoring: 29-30.12.2021

Result

Sr. No.	Location	Noise Level dB(A)			
		Sampling Time	Day Time dB(A) 06 am - 10 pm	Sampling Time	Night Time dB(A) 10 pm - 06 am
			Limit 75 dB(A)		Limit 70 dB(A)
1.	**Nr. LDO Pump House**	11:00 am - 13:05 pm	**62.4**	22:45 pm - 00:35 am	**59.8**
2.	**Nr. 20 MLD Plant**		**63.6**		58.8
3.	**Nr. Pump House**		**65.1**		**60.5**
4.	**Nr. Coal Handling plant**		**63.9**		59.6
5.	**Nr. Gate No.4**		**57.8**		**56.8**
6.	**Nr. Integrated Ash Silo**		**63.1**		58.2
7.	**Nr. Main Gate**		**58.8**		**57.3**
8.	**Nr. APCH Building**		**58.7**		58.3
9.	**Nr. Shantiniketan-I**		**59.3**		**57.9**
10.	**Nr. OHC Building**		**60.7**		59.5

Remark: Calibrated instruments were used during monitoring of above identified sample.

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ENVIRONMENTAL MONITORING REPORT

AMBIENT AIR QUALITY, STACK EMISSION, WATER QUALITY AND NOISE MONITORING

Period: January 2022- March 2022

For

At
Tunda & Siracha,
Tal. Mundra, Dist.: Kutch.
KUTCH, GUJARAT – 370 435

Prepared By

UniStar
Environment & Research Labs Pvt. Ltd.

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QUALITY CONTROL							
Name of Publication	Environmental Quality Monitoring Report for the Quarter January 2022- March 2022						
Project Number	03	**Report No.**	UERL/ENV/JAN/ 01-03 / 2022	**Version**	1	**Released**	April 2022
Project Coordinator	Mr. Bhavin Patel						
Prepared By	Miss. Shweta A. Rana						
Checked By	Mr. Jaivik Tandel						
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FOR
UniStar Environment and
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Mr. Jaivik Tandel
(Authorized By)

UNISTAR ENVIRONMENT & RESEARCH LABS PVT. LTD. GUJARAT VAPI

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LIST OF GRAPHS

EXECUTIVE SUMMARY

Adani Power (Mundra) Limited (APMuL) has total generation capacity of 4620MW in phased manner at Mundra Thermal (coal Based) Power Plant near Village Tunda in Mundra, District Kutch, and Gujarat. The phased wise development being undertaken for ultimate capacity of power plant is shown below.

- First Phase : 2 x 330 MW
- Second Phase : 2 x 330 MW + 2 x 660 MW
- Third Phase : 3 x 660 MW

The Thermal Power Plant is located near Village Tunda, Mundra Taluka in Kutch District. The Site is closed to the sea, making cooling water perennially available for the power plant. The Power Plant is based on supercritical technology using imported coal.

All three phase of the power plant is operational and as the part of the compliance to the statutory requirement, M/s. Adani Power (Mundra) Limited has entrusted the environmental quality monitoring study for the area surrounding the power plant. Adani Power (Mundra) Limited Implemented ISO-14001:2015 Environment Management System (EMS) and Accreditation of NABL in Environmental Laboratory (ISO/IEC 17025:2017) vide Certificate No. TC-5215.

Various environmental parameters have been monitored during the period of January 2022 to March 2022.The detail of the environmental parameters along with frequency of monitoring is shown in subsequent sections.

1. ENVIRONMENTAL PARAMETERS

Sr. No.	Environmental Indices	Parameter	No. of Location and Monitoring.	Frequency of Sampling
1.	Ambient Air Quality	PM_{10}, $PM_{2.5}$, Sulphur Dioxide and Nitrogen Dioxide	Three Location	Twice a week
2.	Ambient Air Quality	PM_{10}, $PM_{2.5}$, Sulphur Dioxide, Nitrogen Dioxide, Ozone and Mercury	Two Location	Once in a month
3.	Stack Monitoring	PM, Sulphur Dioxide, Oxide of Nitrogen and Hg	Nine Location	Once in a month
4.	Meteorological Monitoring	Wind rose, Wind speed, Wind direction, Rainfall, Temperature, Relative Humidity	One location	Round the clock
5.	Surrounding Villages Ground Water Analysis	Colour, Odour, Taste, Turbidity, Dissolved Solids, pH value, Total Hardness, Calcium, Boron, Copper, Iron, Manganese, Chloride, Sulphate, Nitrate, Fluoride, Phenolic Compounds, Mercury, Cadmium, Selenium, Arsenic, Cyanide, Lead, Zinc, Anionic Detergents as MBAS, Chromium Cr+6, Mineral Oil, MPN Index for Coliform Bacteria per 100 ml, Residual Free Chlorine, Aluminium, Alkalinity, Magnesium as Mg, Escherichia Coli in 250 ml.	Five Location	Once in Quarter
6.	Effluent Water Sample	pH, Temperature, colour, SS, O & G, BOD3, COD, Chlorides, TDS, Sulphates, Ammonical Nitrogen, % Sodium, Sodium Absorption Ratio, Sulphides, Total Chromium, Hexavalent Chromium, Copper, Lead, Zinc, Free available chlorine, Phosphate, Iron	Four Location	Once in a month / Quarter
7.	STP Water Analysis	pH, Residual Chlorine, SS, BOD, COD, Faecal coliform	Three Location	Once in month/ Quarter
8.	Borwell water Near Ash Dyke Area	pH @ 25 ° C, Conductivity (µS), Chloride as Cl^- Salinity (ppt), Total Dissolved Solids, Carbonate as CaCO3, Bicarbonate as CaCO3, Mercury as Hg,Arsenic as As, Lead as Pb, Chromium as Cr, Cadmium as Cd.	Four Location	Once in a Quarter
9.	Surrounding Villages Soil Analysis	Magnesium as Mg %, Molybdenium as Mo in ppm, Phosphorus as P %, Calcium as Ca %, Zinc as Zn, Manganese as Mn, Potassium as K%, Nitrogen as N%, Iron as Fe%, Copper as Cu, Boron as B, Sulphurin %, Chloride as Cl%.	Five Location	Once in Six Month
10.	Noise Level Monitoring	Noise level monitoring in dB(A)	10 Location	Once in a Quarter
11.	Cooling tower	pH @ 25 ° C, Free available chlorine, Zinc as Zn, Hexavalent Chromium, Total Chromium, Phosphate	09 Location	Once in a Quarter

1.1 AMBIENT AIR QUALITY

The scenario of the Ambient Air Quality in the study region has been assessed through a network of 5locations of Ambient Air Quality Monitoring. The design of monitoring network in the air quality surveillance program was based on the following considerations.

- Topography / Terrain of the study area.
- Human Settlements
- Wind pattern
- Health status
- Representation of regional Background levels.
- Accessibility of monitoring site.
- Resource availability.

Pre-calibrated Respirable Dust Samplers (PM_{10}) & Fine Dust Samplers ($PM_{2.5}$) have been used for monitoring the existing AAQM Status. Maximum, Minimum, Average, Standard Deviation and percentile have been computed from the raw data collected at all individual sampling stations to represents the Ambient Air Quality Status.

The significant parameters viz., PM_{10}, $PM_{2.5}$, Sulphur Dioxide (SO_2) and Nitrogen Dioxides (NO_2) and Mercury were monitored within the study area of 10 km from the site.

1.2 FLUE GAS MONITORING

All three phases of the Thermal Power Plant is in operation. The flue gas emission from stack attached to individual boiler is monitored once in month during the monitoring period.

1.3 WATER QUALITY MONITORING

The water quality parameters as per IS: 10500 for water resource within the study area have been used for describing the water environment and assessing the impacts on it.

Groundwater samples of nearby villages were collected at five locations the parameters of prime importance selected under physicochemical characteristics were estimated to describe the baseline environmental status of the water resources during the monitoring period. Four bore well samples surrounding the ash dyke area were collected during the month of February 2022 along with outfall water sample.

1.4 AMBIENT NOISE LEVEL MONITORING

The Ambient Noise levels within the plant premises were relocated at a different location (10 nos.) For the implementation of effective noise control programs.

1.5 MICROMETEOROLOGY

Meteorological parameters are important factors in the study of Air Pollution. The Transport and diffusion of the pollutants in the atmosphere are governed by meteorological factors.

Primary / Basic Meteorological Parameters

- Wind Velocity
- Wind Direction

Since the dispersion and diffusion of pollutants mainly depend on the above factors hence these factors are considered as primary meteorological parameters.

Secondary Meteorological Parameters

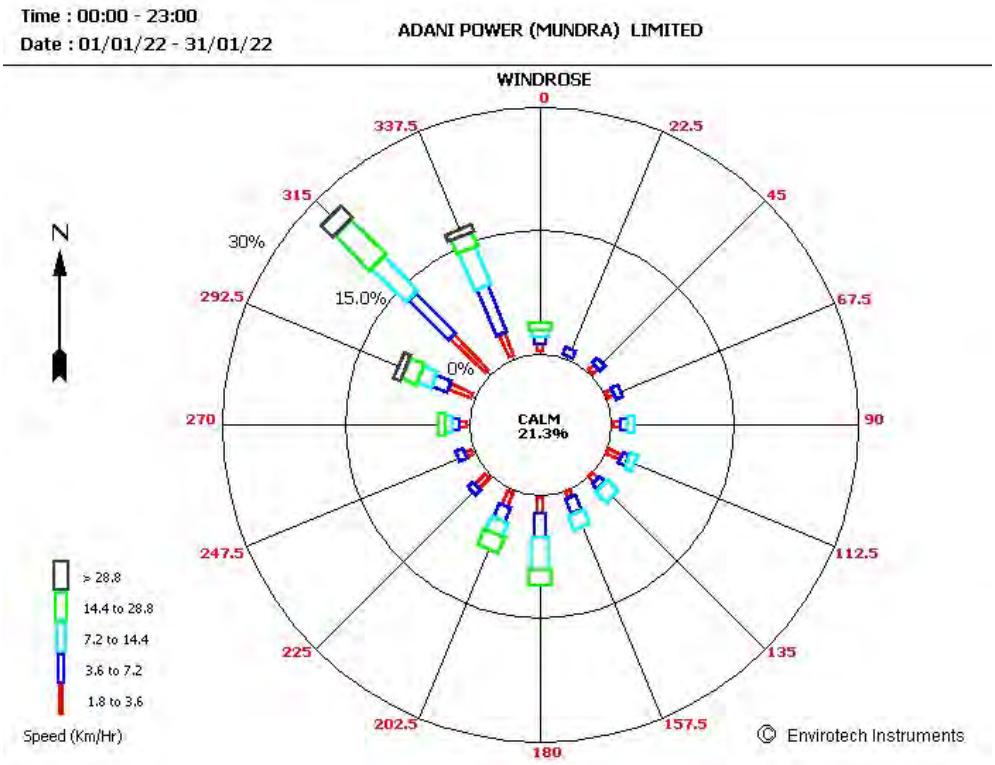
- Relative Humidity
- Ambient Temperature

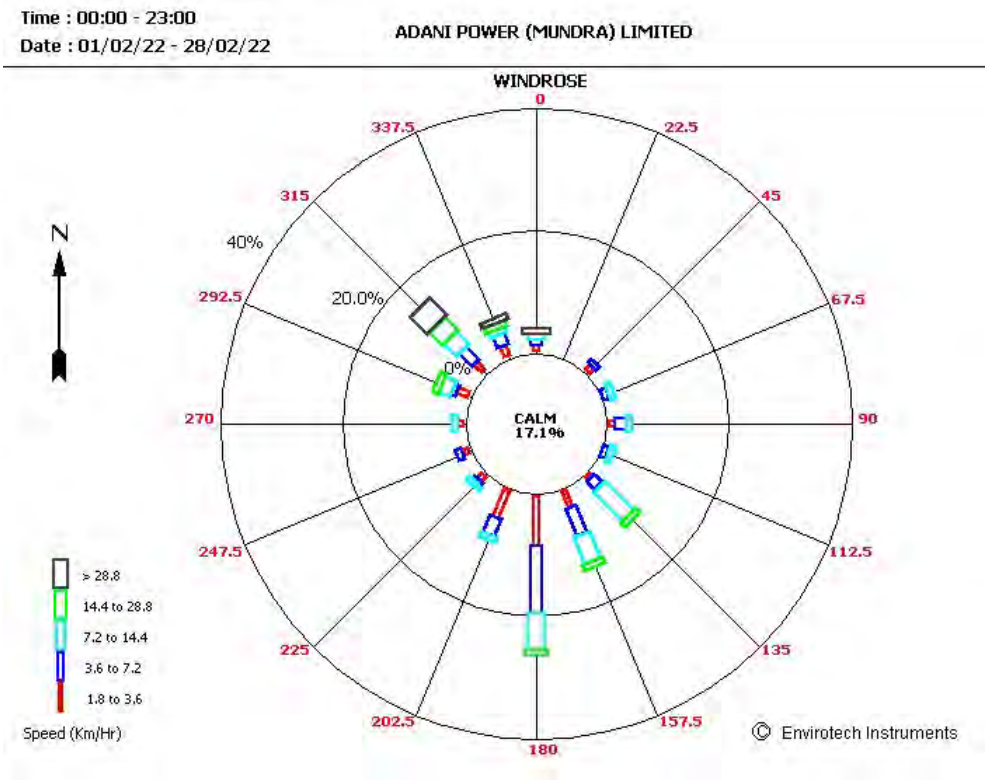
The above-said factors are considered as secondary factors since these factors control the dispersion of the pollutant indirectly by affecting the primary factors.

1.5.1 Wind Rose Diagram

Project	:	**Adani Power (Mundra) Limited (APMuL)**	**Period**	**:**	January 2022 to March 2022
Location	:	**Village – Tunda, Dist. - Kutch**			
January 2022					
Wind Direction			**NW**		
Average Wind Speed			**7.1 km/hr**		
February 2022					
Wind Direction			**S**		
Average Wind Speed			**6.4 km/hr**		
March 2022					
Wind Direction			**SSW**		
Average Wind Speed			**7.0 km/hr**		

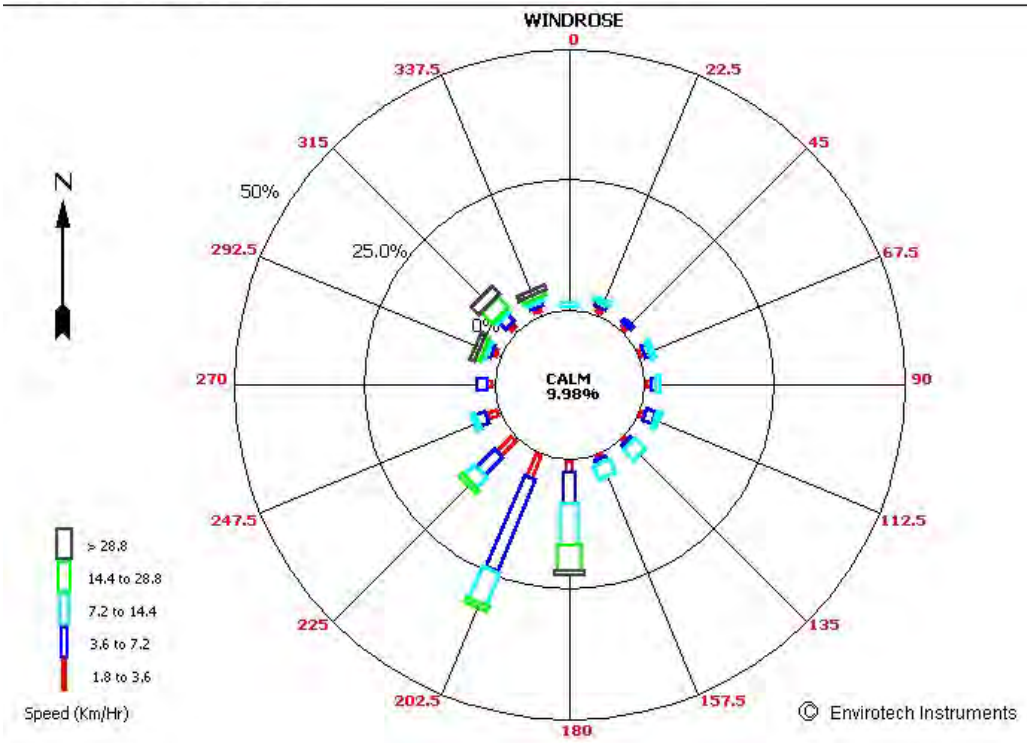
ADANI POWER (MUNDRA) LIMITED – MUNDRA WINDROSE FOR THE SEASON OF Jan. to March. 2022





Time : 00:00 - 23:00
Date : 01/03/22 - 31/03/22

ADANI POWER (MUNDRA) LIMITED



2 SCOPE & METHODOLOGY ADOPTED FOR ENVIRONMENTAL MONITORING

2.1 Introduction

The scope of the study includes detailed characterization of various environmental like air, water and noise within an area of 10 km radius in and around the power plant area at 20 MLD Plant, Shantiniketan-1 and surrounding villages named as Siracha, Wandh and Kandagara of Dist. Kutch.

The above-mentioned environmental components were monitored at the study area and frequency of monitoring, number of samples along with methodology is as shown in below table.

2.2 Scope and Methodology for Monitoring of Various Environmental Attributes

Sr. No	Environmental Attributes	Sampling Locations	Sampling Parameters	Sampling Frequency	Total No of samples	Methodology
1	Ambient Air Quality	3	PM_{10}, $PM_{2.5}$, SO_2, NO_2	Twice a week (24 hourly Samples)	72	IS : 5182 & Reference APHA(AIR)
2	Ambient Air Quality	5	PM_{10}, $PM_{2.5}$, SO_2, NO_2, O_3, Mercury	Once in month (24 hourly Samples)	15	IS : 5182 & Reference APHA(AIR)
2	Flue Gas Stack Analysis	Unit 1 to 9 Boiler	PM, SO_2, NOx	Once in month	27	As per IS : 11255
3	Surrounding Villages Ground Water Analysis	5 water sample	Test specification as per IS : 10500 - 1991	Once in Quarter	5	AS per APHA Method
4	Water Quality of Outfall for APMuL	1	As per CTO	Once in month	3	As Per APHA Method
5	STP Outlet	1	As per CTO	Once in month	3	As Per APHA Method
6	Bore well water Near Ash Dyke Area	4	Test specification as per IS : 10500 - 1991	Once in Quarter	4	As Per APHA Method
7	Cooling Tower Blow down Water Sample	9	As per CTO	Once in Quarter	9	As Per APHA Method
8	Condensate Cooling Tower Water Sample	9	As per CTO	Once in Quarter	9	As Per APHA Method
9	Boiler Blow down Water Sample	9	As per CTO	Once in Quarter	9	As Per APHA Method

3 ENVIRONMENAT AIR QUALITY AND FLUE GAS MONITORING

The principle objective of the ambient air quality was to assess the existing levels of the air pollution as well as the regional background concentration in the plant area. Air pollution forms important and critical factors to study the environmental issues in the study areas. Thus, air quality has to be frequently monitored to know the extent of pollution due to power plant activity and other ancillary activities. Details are provided in Section 3.1.1.

Flue gas monitoring analysis has been conducted by UniStar Environment and Research Labs Pvt. Ltd. Details are provided in Section 3.2.

3.1 Ambient Air Monitoring Data

3.1.1 Details of Ambient Air Quality Monitoring Stations

The detail of the ambient air monitoring locations including the distance from the project site with direction is as shown below.

S.No.	Code	Name of sampling location	Distance
1	A - 1	Nr.20 MLD Plant	1.2 Km
2	A - 2	Nr. Shantiniketan-1	0.8 Km
3	A - 3	Kandagara Village	3.2 km (NW)
4	A - 4	Siracha Village	2.6 km (NE)
5	A - 5	Wandh Village	2.0 km (SW)

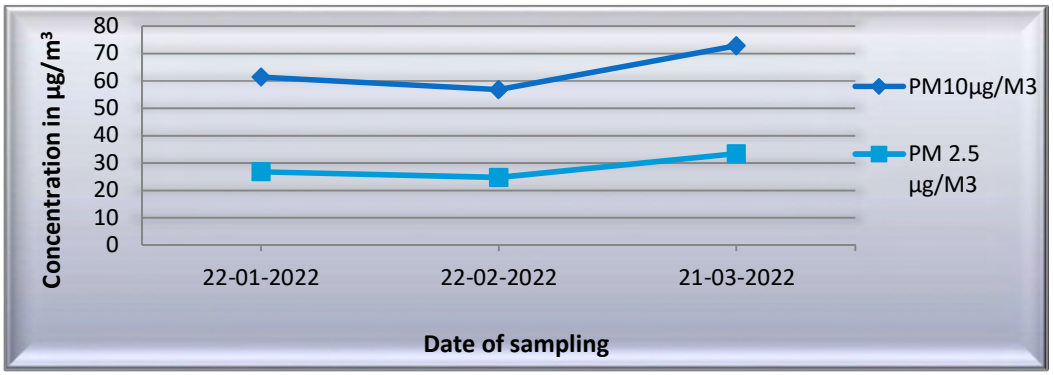
3.1.2 Location: Nr.20 MLD Plant

The Sampling station was located in the core zone in Company premises. The Respirable Dust Sampler (PM_{10}) & ($PM_{2.5}$) Sampler were placed at a height of 3 m above the ground level. Assess present pollution level the observed levels of PM_{10}, $PM_{2.5}$, SO_2, NO_2 and O_3 collected during monitoring period (Jan. 2022-Mar. 2022) are as follows:

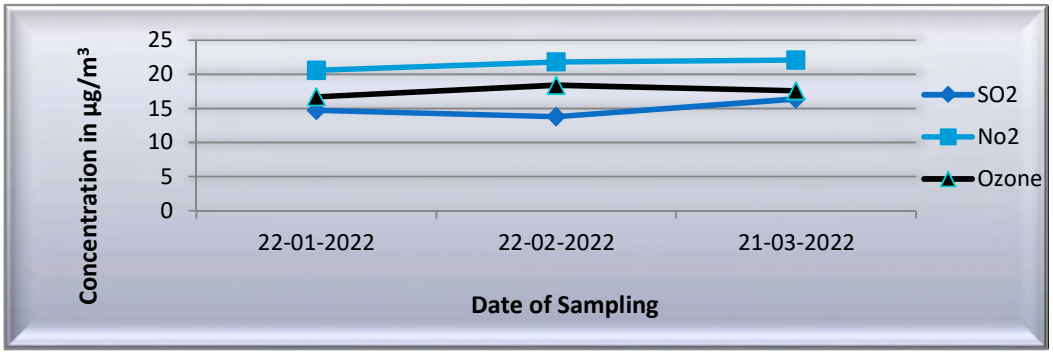
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	**72.8**	**33.4**	**16.4**	**22.1**	**18.4**
Minimum Value	**56.8**	**24.7**	**13.8**	**20.6**	**16.7**
Average Value	**63.7**	**28.3**	**15.0**	**21.5**	**17.5**
Standard Deviation	**8.2**	**4.5**	**1.3**	**0.8**	**0.8**
Permissible Limits	**100**	**60**	**80**	**80**	**100**

Units: µg/m^3

Graph 1 : Particulate Matter Level Nr.20 MLD Plant



Graph 2: SO2, NO2 and O_3 Nr.20 MLD Plant



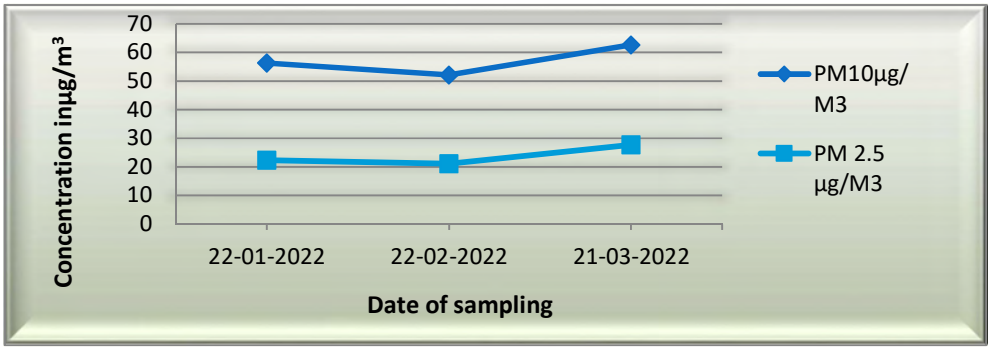
3.1.3 Location: Nr. Shantiniketan-1

The Sampling station was located in the core zone in company premises. The Respirable Dust SamplerPM_{10} & $PM_{2.5}$Sampler were placed at a height of 3 m above the ground level. The observed levels of PM_{10}, $PM_{2.5}$, SO_2, NO_2 and O_3 collected during monitoring period (Jan. 2022-Mar. 2022) are as follows

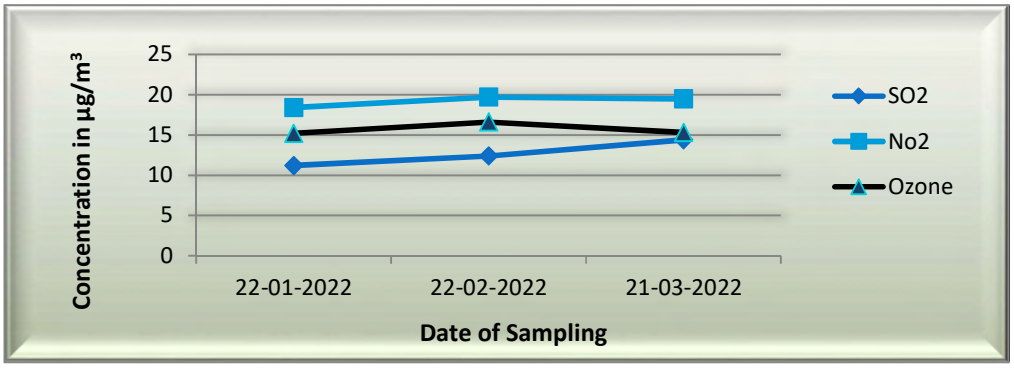
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	**62.6**	**27.7**	**14.4**	**19.7**	**16.6**
Minimum Value	**52.1**	**21.1**	**11.2**	**18.4**	**15.2**
Average Value	**57.0**	**23.7**	**12.7**	**19.2**	**15.7**
Standard Deviation	**5.3**	**3.5**	**1.6**	**0.7**	**0.7**
Permissible Limits	**100**	**60**	**80**	**80**	**100**

Units: $\mu g/m^3$

Graph 3: Particulate Matter Level Nr. Shantiniketan-1



Graph 4 : SO2, NO2 and O_3 Nr. Shantiniketan-1



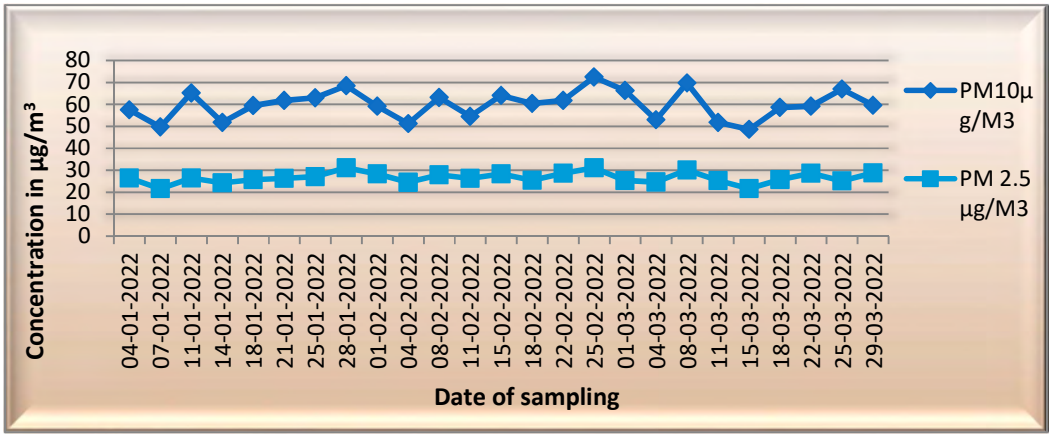
3.1.4 Location: Kandagara Village

The Sampling station was located in the core zone. The Station is located at about 3 km away in Northwest Direction from the Company premises. The Respirable Dust Sampler (PM_{10}) & $PM_{2.5}$Sampler were placed at a height of 2.5 m above the ground level. The observed levels of PM_{10}, $PM_{2.5}$, SO_2, NO_2 and O_3 collected during the monitoring period (Jan. 2022-Mar. 2022) are as follows.

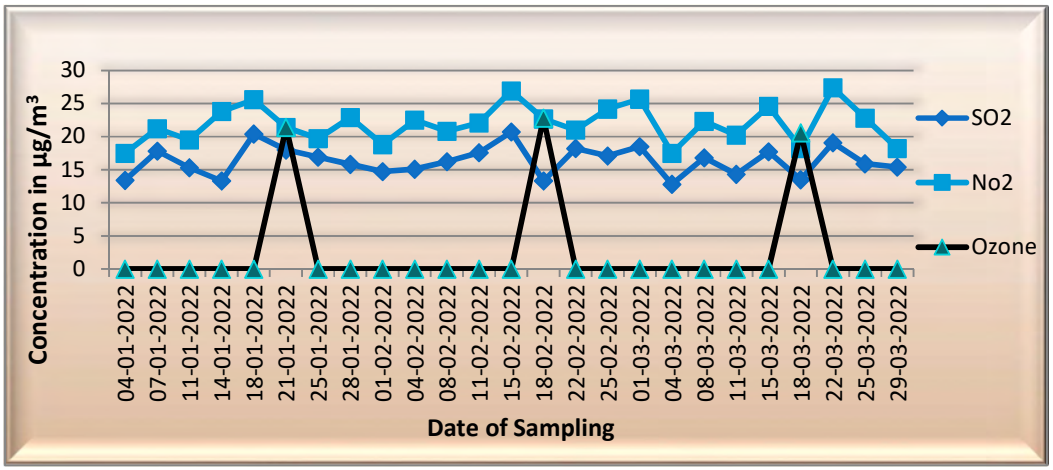
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	**72.5**	**31.1**	**20.7**	**27.4**	**22.8**
Minimum Value	**48.6**	**21.6**	**12.8**	**17.5**	**21.4**
Average Value	**59.9**	**26.6**	**16.3**	**21.9**	**22.1**
Standard Deviation	**6.5**	**2.5**	**2.2**	**2.8**	**0.9**
Permissible Limits	**100**	**60**	**80**	**80**	**100**

Units: µg/m^3

Graph 5: Particulate Matter Level Kandagara Village



Graph 6 : SO2, NO2 and O_3 Level Kandagara Village



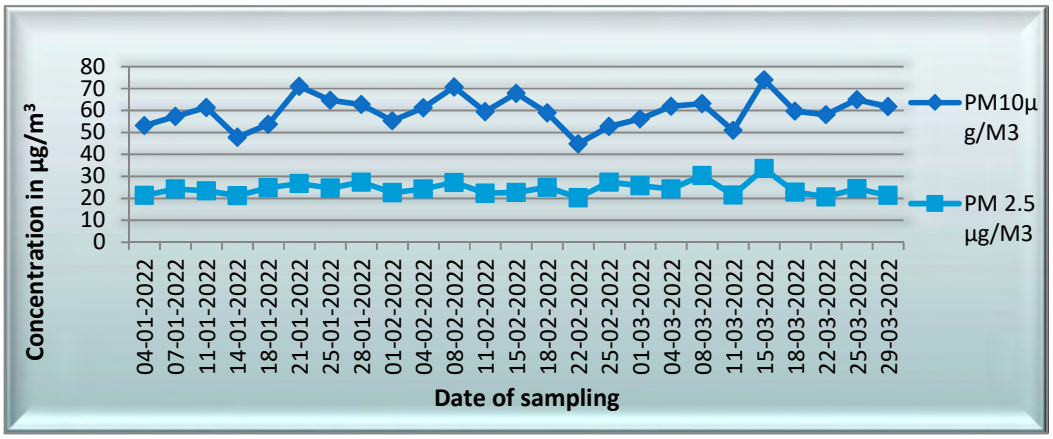
3.1.5 Location: Siracha Village

The Sampling station was located in the Siracha village. The Station is located at about 3.5 km away in Northwest Direction from the core zone area. The Respirable Dust Sampler & $PM_{2.5}$ was placed at a height of 3.0 m above the ground level. The observed levels of PM_{10}, $PM_{2.5}$, SO_2, NO_2 and O_3 collected during the monitoring period (Jan. 2022-Mar. 2022) are as follows.

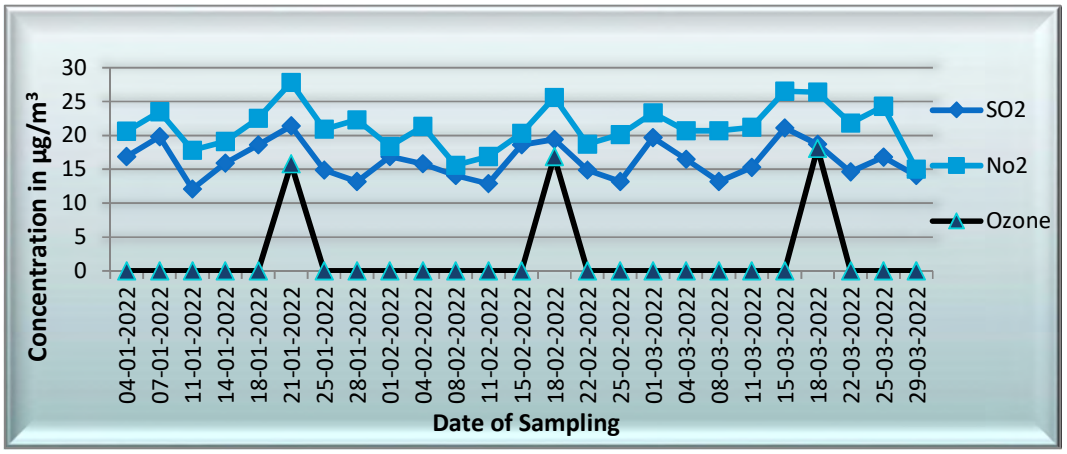
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	74	33.5	21.4	27.8	16.9
Minimum Value	44.8	20.3	12.1	15	15.8
Average Value	59.7	24.4	16.3	21.3	16.3
Standard Deviation	7.1	3.1	2.7	3.3	0.7
Permissible Limits	100	60	80	80	100

Units: $\mu g/m^3$

Graph 7 : Particulate Matter Level Siracha Village



Graph 8 : SO_2, NO_2 and O_3 Level Siracha Village



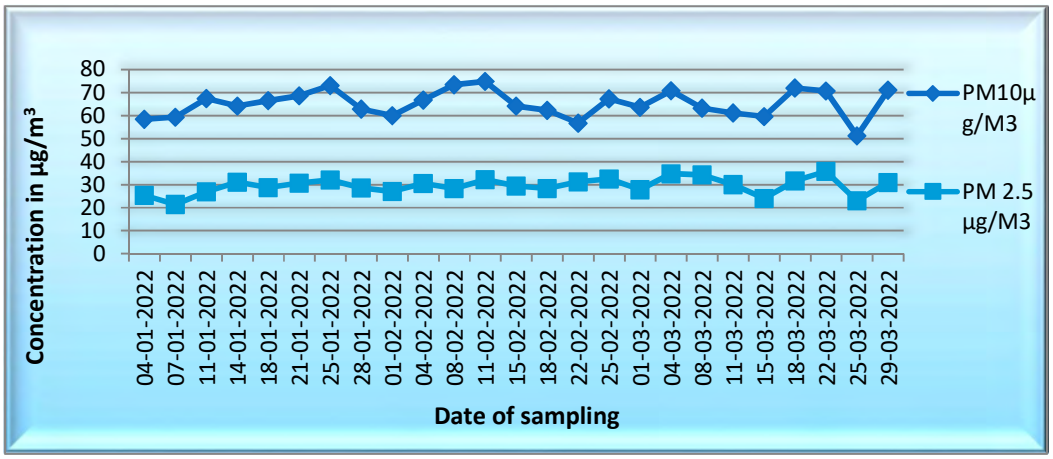
3.1.6 Location: Wandh Village

The Sampling station was located in the core zone in Wandh village. The Station is located at about 3.0 km away in Southwest Direction from the Company premises. The Respirable Dust Sampler Was placed at a height of 3.0 m above the ground level. The observed levels of PM_{10}, $PM_{2.5}$, SO_2, NO_2 and O_3 collected during the monitoring period (Jan. 2022-Mar. 2022) are as follows.

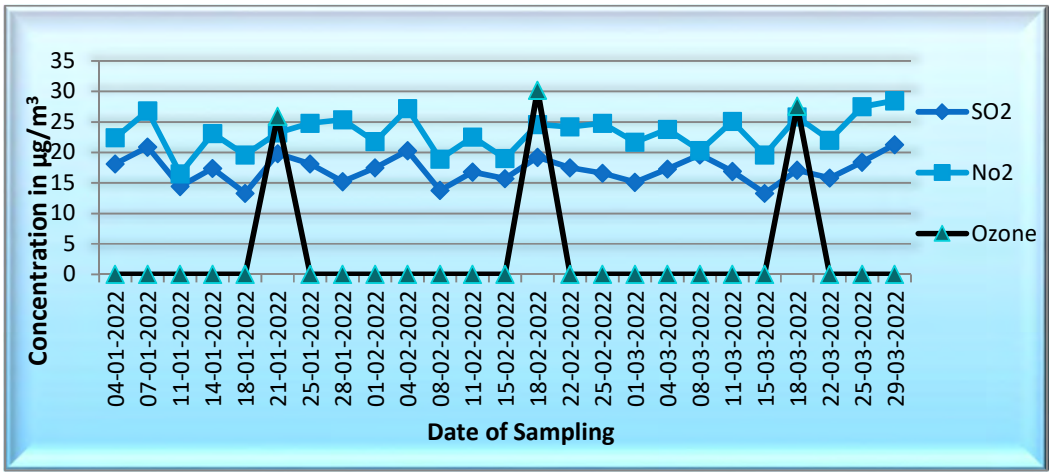
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	**74.9**	**35.8**	**21.3**	**28.5**	**30.2**
Minimum Value	**51.2**	**21.4**	**13.3**	**16.5**	**25.9**
Average Value	**65.2**	**29.5**	**17.2**	**23.2**	**28.0**
Standard Deviation	**5.9**	**3.6**	**2.3**	**3.0**	**3.0**
Permissible Limits	**100**	**60**	**80**	**80**	**100**

Units: $\mu g/m^3$

Graph 9 : Particulate Matter Level Wandh Village



Graph 10 : SO_2, NO_2 and O_3 Level Wandh Village



3.1.7 Ambient Air Quality Monitoring (Parameters- Mercury & Ozone)

Location	January -2022			February-2022			March-2022		
	Date	**Ozone (O3) µg/m3**	**Mercury (Hg) µg/m3**	**Date**	**Ozone (O3) µg/m3**	**Mercury (Hg) µg/m3**	**Date**	**Ozone (O3) µg/m3**	**Mercury (Hg) µg/m3**
Village Kandagara	**21.01.22**	21.4	BDL	**18.02.22**	22.8	BDL	**18.03.22**	20.6	BDL
Village Wandh	**21.01.22**	25.9	BDL	**18.02.22**	30.2	BDL	**18.03.22**	27.6	BDL
Village Siracha	**21.01.22**	15.8	BDL	**18.02.22**	16.9	BDL	**18.03.22**	18.1	BDL
Nr. 20 MLD Plant	**22.01.22**	16.7	BDL	**22.02.22**	18.4	BDL	**21.03.22**	17.6	BDL
Nr. Shantiniketan-1	**22.01.22**	15.2	BDL	**22.02.22**	16.6	BDL	**21.03.22**	15.3	BDL
Remark: **Calibrated equipment & instruments were used during monitoring & analysis of above identified sample.**									
Analysis Method Reference :									
Hg : AAS by VGA Method -3112 B APHA 22 Edition : BDL Limit Hg **: 2 ppb**									
O_3 : IS - 5182 (part 9) 2009 Ozone BDL limit: 5 µg/m^3									

3.2 Flue Gas Monitoring Data

Stack monitoring has been carried out by UniStar environment & Research Pvt. Ltd.

Date	Location	PM in mg/Nm^3	SO_2 in mg/Nm^3	NO_x in mg/Nm^3
06-01-2022	Boiler (Unit - 1)	32.3	532.4	292.4
08-03-2022	Boiler (Unit - 1)	32.3	546.4	276.8
06-01-2022	Boiler (Unit - 2)	30.1	522.3	288.6
08-03-2022	Boiler (Unit - 2)	28.8	525.8	291.2
19-01-2022	Boiler (Unit - 3)	35.7	525.6	298.3
07-02-2022	Boiler (Unit - 3)	31.8	558.6	288.2
02-03-2022	Boiler (Unit - 3)	30.2	511.4	289.8
19-01-2022	Boiler (Unit - 4)	30.6	468.4	278.4
07-02-2022	Boiler (Unit - 4)	29.4	524.7	292.4
02-03-2022	Boiler (Unit - 4)	31.4	518.9	281.4
17-03-2022	Boiler (Unit - 5)	34.6	485.2	274.9
17-03-2022	Boiler (Unit -6)	40.1	551.4	282.8
Permissible Limits		**50**	**<500 MWH-600** **>500 MWH-200**	**450**

3.3 Water Quality Monitoring

3.3.1 Location: Tunda Village Water Sample **DATE: 26/02/2022**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.35	6.5 – 8.5	6.5 – 8.5
2	Color	Pt-Co	10	5	15
3	Odor	mg/L	Agreeable	Unobjectionable	Unobjectionable
4	Taste	mg/L	Agreeable	Agreeable	Agreeable
5	Turbidity(NTU)	mg/L	BDL(MDL:0.1)	1 NTU	5 NTU
6	Total Hardness as $CaCO_3$	mg/L	137.7	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	28.8	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	16.0	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1392	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	343.3	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	461.1	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	142.2	200 mg/lit.	400 mg/lit.
13	Nitrate as NO_3	mg/L	4.1	45 mg/lit.	45 mg/lit.
14	Copper as Cu	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	1.5 mg/lit.
15	Manganese as Mn	mg/L	BDL(MDL:0.1)	0.1 mg/lit.	0.3 mg/lit.
16	Iron as Fe	mg/L	BDL(MDL:0.1)	0.3 mg/lit.	0.3 mg/lit.
17	Residual Free Chlorine	mg/L	0.28	0.2 mg/lit.	1.0 mg/lit.
18	Fluoride as F	mg/L	0.69	1.0 mg/lit.	1.5 mg/lit.
19	Zinc as Zn	mg/L	BDL(MDL:0.05)	5 mg/lit.	15 mg/lit.
20	Phenolic Compound	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.002 mg/lit.
21	Mercury as Hg	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.001 mg/lit.
22	Cadmium as Cd	mg/L	BDL(MDL:0.003)	0.003 mg/lit.	0.003 mg/lit.
23	Selenium as Se	mg/L	N.D.	0.01 mg/lit.	0.01 mg/lit.
24	Arsenic as as	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	0.05 mg/lit.
25	Cyanide as CN	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
26	Lead as Pb	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	0.01 mg/lit.
27	Anionic Detergent	mg/L	N.D.	0.2 mg/lit.	1.0 mg/lit.
28	Hexavalent Chromium	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
29	Mineral Oil	mg/L	N.D.	0.5 mg/lit.	0.5 mg/lit.
30	Aluminum as Al	mg/L	BDL(MDL:0.003)	0.03 mg/lit.	0.2 mg/lit.
31	Boron as B	mg/L	BDL(MDL:0.5)	0.5 mg/lit.	1 mg/lit.
32	Total Chromium as Cr	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
33	Total Coliform	(CFU/100 ml)	Absent	Absent	Absent
34	E. coli	(CFU/100 ml)	Absent	Absent	Absent
35	Total Bacterial Count	(CFU/ml)	12	100 CFU/ml	100 CFU/ml
Note: BDL= Below Detection Limit. N.D. = Not Detected					

3.3.2 Location: Kandagra Village Water Sample **DATE: 26/02/2022**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.32	6.5 – 8.5	6.5 – 8.5
2	Color	Pt-Co	10	5	15
3	Odor	mg/L	Agreeable	Unobjectionable	Unobjectionable
4	Taste	mg/L	Agreeable	Agreeable	Agreeable
5	Turbidity(NTU)	mg/L	BDL(MDL:0.1)	1 NTU	5 NTU
6	Total Hardness as $CaCO_3$	mg/L	125.4	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	24.8	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	16	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1310	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	339.7	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	337.1	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	118.5	200 mg/lit.	400 mg/lit.
13	Nitrate as NO_3	mg/L	3.5	45 mg/lit.	45 mg/lit.
14	Copper as Cu	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	1.5 mg/lit.
15	Manganese as Mn	mg/L	BDL(MDL:0.1)	0.1 mg/lit.	0.3 mg/lit.
16	Iron as Fe	mg/L	BDL(MDL:0.1)	0.3 mg/lit.	0.3 mg/lit.
17	Residual Free Chlorine	mg/L	0.36	0.2 mg/lit.	1.0 mg/lit.
18	Fluoride as F	mg/L	0.81	1.0 mg/lit.	1.5 mg/lit.
19	Zinc as Zn	mg/L	BDL(MDL:0.05)	5 mg/lit.	15 mg/lit.
20	Phenolic Compound	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.002 mg/lit.
21	Mercury as Hg	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.001 mg/lit.
22	Cadmium as Cd	mg/L	BDL(MDL:0.003)	0.003 mg/lit.	N.D.(MDL:0.001)
23	Selenium as Se	mg/L	N.D.	0.01 mg/lit.	N.D.
24	Arsenic as as	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	N.D.(MDL:0.01)
25	Cyanide as CN	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	N.D.
26	Lead as Pb	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	N.D.(MDL:0.003)
27	Anionic Detergent	mg/L	N.D.	0.2 mg/lit.	N.D.
28	Hexavalent Chromium	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	N.D.(MDL:0.1)
29	Mineral Oil	mg/L	N.D.	0.5 mg/lit.	N.D.
30	Aluminum as Al	mg/L	BDL(MDL:0.003)	0.03 mg/lit.	N.D.
31	Boron as B	mg/L	BDL(MDL:0.5)	0.5 mg/lit.	N.D.
32	Total Chromium as Cr	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	N.D.(MDL:0.001)
33	Total Coliform	(CFU/100 ml)	Absent	Absent	Absent
34	E. coli	(CFU/100 ml)	Absent	Absent	Absent
35	Total Bacterial Count	(CFU/ml)	12	100 CFU/ml	100 CFU/ml
Note: BDL= Below Detection Limit. N.D. = Not Detected					

3.3.3Location: Siracha Village Water Sample **DATE: 26/02/2022**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.23	6.5 – 8.5	6.5 – 8.5
2	Color	Pt-Co	10	5	15
3	Odour	mg/L	Agreeable	Unobjectionable	Unobjectionable
4	Taste	mg/L	Agreeable	Agreeable	Agreeable
5	Turbidity(NTU)	mg/L	BDL(MDL:0.1)	1 NTU	5 NTU
6	Total Hardness as $CaCO_3$	mg/L	327.3	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	62.1	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	45.8	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1278	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	392.7	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	365.5	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	195.5	200 mg/lit.	400 mg/lit.
13	Nitrate as NO_3	mg/L	3.9	45 mg/lit.	45 mg/lit.
14	Copper as Cu	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	1.5 mg/lit.
15	Manganese as Mn	mg/L	BDL(MDL:0.1)	0.1 mg/lit.	0.3 mg/lit.
16	Iron as Fe	mg/L	BDL(MDL:0.1)	0.3 mg/lit.	0.3 mg/lit.
17	Residual Free Chlorine	mg/L	0.36	0.2 mg/lit.	1.0 mg/lit.
18	Fluoride as F	mg/L	0.67	1.0 mg/lit.	1.5 mg/lit.
19	Zinc as Zn	mg/L	BDL(MDL:0.05)	5 mg/lit.	15 mg/lit.
20	Phenolic Compound	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.002 mg/lit.
21	Mercury as Hg	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.001 mg/lit.
22	Cadmium as Cd	mg/L	BDL(MDL:0.003)	0.003 mg/lit.	0.003 mg/lit.
23	Selenium as Se	mg/L	N.D.	0.01 mg/lit.	0.01 mg/lit.
24	Arsenic as as	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	0.05 mg/lit.
25	Cyanide as CN	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
26	Lead as Pb	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	0.01 mg/lit.
27	Anionic Detergent	mg/L	N.D.	0.2 mg/lit.	1.0 mg/lit.
28	Hexavalent Chromium	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
29	Mineral Oil	mg/L	N.D.	0.5 mg/lit.	0.5 mg/lit.
30	Aluminum as Al	mg/L	BDL(MDL:0.003)	0.03 mg/lit.	0.2 mg/lit.
31	Boron as B	mg/L	BDL(MDL:0.5)	0.5 mg/lit.	1 mg/lit.
32	Total Chromium as Cr	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
33	Total Coliform	(CFU/100 ml)	Absent	Absent	Absent
34	E. coli	(CFU/100 ml)	Absent	Absent	Absent
35	Total Bacterial Count	(CFU/ml)	10	100 CFU/ml	100 CFU/ml

Note: BDL= Below Detection Limit. N.D. = Not Detected

3.3.4 Location: Navinal Village Water Sample **DATE: 26/02/2022**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.49	6.5 – 8.5	6.5 – 8.5
2	Colour	Pt-Co	10	5	15
3	Odour	mg/L	Agreeable	Unobjectionable	Unobjectionable
4	Taste	mg/L	Agreeable	Agreeable	Agreeable
5	Turbidity(NTU)	mg/L	BDL(MDL:0.1)	1 NTU	5 NTU
6	Total Hardness as $CaCO_3$	mg/L	166.7	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	37.6	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	17.7	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1256	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	238.3	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	356.1	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	99.2	200 mg/lit.	400 mg/lit.
13	Nitrate as NO_3	mg/L	2.5	45 mg/lit.	45 mg/lit.
14	Copper as Cu	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	1.5 mg/lit.
15	Manganese as Mn	mg/L	BDL(MDL:0.1)	0.1 mg/lit.	0.3 mg/lit.
16	Iron as Fe	mg/L	BDL(MDL:0.1)	0.3 mg/lit.	0.3 mg/lit.
17	Residual Free Chlorine	mg/L	0.26	0.2 mg/lit.	1.0 mg/lit.
18	Fluoride as F	mg/L	0.59	1.0 mg/lit.	1.5 mg/lit.
19	Zinc as Zn	mg/L	BDL(MDL:0.05)	5 mg/lit.	15 mg/lit.
20	Phenolic Compound	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.002 mg/lit.
21	Mercury as Hg	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.001 mg/lit.
22	Cadmium as Cd	mg/L	BDL(MDL:0.003)	0.003 mg/lit.	0.003 mg/lit.
23	Selenium as Se	mg/L	N.D.	0.01 mg/lit.	0.01 mg/lit.
24	Arsenic as as	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	0.05 mg/lit.
25	Cyanide as CN	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
26	Lead as Pb	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	0.01 mg/lit.
27	Anionic Detergent	mg/L	N.D.	0.2 mg/lit.	1.0 mg/lit.
28	Hexavalent Chromium	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
29	Mineral Oil	mg/L	N.D.	0.5 mg/lit.	0.5 mg/lit.
30	Aluminum as Al	mg/L	BDL(MDL:0.003)	0.03 mg/lit.	0.2 mg/lit.
31	Boron as B	mg/L	BDL(MDL:0.5)	0.5 mg/lit.	1 mg/lit.
32	Total Chromium as Cr	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
33	Total Coliform	(CFU/100 ml)	Absent	Absent	Absent
34	E. coli	(CFU/100 ml)	Absent	Absent	Absent
35	Total Bacterial Count	(CFU/ml)	14	100 CFU/ml	100 CFU/ml

Note: BDL= Below Detection Limit. N.D. = Not Detected

3.3.5Location: Desalpur Village Water Sample **DATE: 26/02/2022**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.41	6.5 – 8.5	6.5 – 8.5
2	Color	Pt-Co	10	5	15
3	Odor	mg/L	Agreeable	Unobjectionable	Unobjectionable
4	Taste	mg/L	Agreeable	Agreeable	Agreeable
5	Turbidity(NTU)	mg/L	BDL(MDL:0.1)	1 NTU	5 NTU
6	Total Hardness as $CaCO_3$	mg/L	114.3	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	25.2	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	12.5	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1108	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	315.3	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	407.5	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	134.2	200 mg/lit.	400 mg/lit.
13	Nitrate as NO_3	mg/L	3.5	45 mg/lit.	45 mg/lit.
14	Copper as Cu	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	1.5 mg/lit.
15	Manganese as Mn	mg/L	BDL(MDL:0.1)	0.1 mg/lit.	0.3 mg/lit.
16	Iron as Fe	mg/L	BDL(MDL:0.1)	0.3 mg/lit.	0.3 mg/lit.
17	Residual Free Chlorine	mg/L	0.29	0.2 mg/lit.	1.0 mg/lit.
18	Fluoride as F	mg/L	0.49	1.0 mg/lit.	1.5 mg/lit.
19	Zinc as Zn	mg/L	BDL(MDL:0.05)	5 mg/lit.	15 mg/lit.
20	Phenolic Compound	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.002 mg/lit.
21	Mercury as Hg	mg/L	BDL(MDL:0.001)	0.001 mg/lit.	0.001 mg/lit.
22	Cadmium as Cd	mg/L	BDL(MDL:0.003)	0.003 mg/lit.	0.003 mg/lit.
23	Selenium as Se	mg/L	N.D.	0.01 mg/lit.	0.01 mg/lit.
24	Arsenic as as	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	0.05 mg/lit.
25	Cyanide as CN	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
26	Lead as Pb	mg/L	BDL(MDL:0.01)	0.01 mg/lit.	0.01 mg/lit.
27	Anionic Detergent	mg/L	N.D.	0.2 mg/lit.	1.0 mg/lit.
28	Hexavalent Chromium	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
29	Mineral Oil	mg/L	N.D.	0.5 mg/lit.	0.5 mg/lit.
30	Aluminum as Al	mg/L	BDL(MDL:0.003)	0.03 mg/lit.	0.2 mg/lit.
31	Boron as B	mg/L	BDL(MDL:0.5)	0.5 mg/lit.	1 mg/lit.
32	Total Chromium as Cr	mg/L	BDL(MDL:0.05)	0.05 mg/lit.	0.05 mg/lit.
33	Total Coliform	(CFU/100 ml)	Absent	Absent	Absent
34	E. coli	(CFU/100 ml)	Absent	Absent	Absent
35	Total Bacterial Count	(CFU/ml)	12	100 CFU/ml	100 CFU/ml

Note: Colour = 1(10) = 10 APHA, BDL= Below Detection Limit. N.D. = Not Detected

3.4 Water Quality Monitoring – Plant area

3.4.1 Location: Outfall Channel

Sr. No.	Parameter	Unit	Date of sampling
			16/03/2021
1	pH @ 25	--	8.11
2	Temperature	^{0}C (Intake)	28.0
		^{0}C (Outfall)	30.5
		^{0}C (Differential)	2.5
3	Color	Pt. CO. Scale	10
4	Total Suspended Solids	mg/L	28
5	Oil & Grease	mg/L	BDL(MDL:2.0)
6	Ammonical Nitrogen	mg/L	BDL(MDL:2.0)
7	Sulphide as S-2	mg/L	BDL(MDL:0.05)
8	Total Chromium	mg/L	BDL(MDL:0.05)
9	Hexavalent Chromium as Cr+6	mg/L	BDL(MDL:0.05)
10	Phosphate as PO_4	mg/L	0.19
11	Lead as Pb	mg/L	0.032
12	Copper as Cu	mg/L	BDL(MDL:0.05)
13	Zinc as Zn	mg/L	BDL(MDL:0.05)
14	Iron (as Fe)	mg/L	0.119
15	Chemical Oxygen Demand(COD)	mg/L	35.2
16	Biochemical Oxygen Demand (BOD)	mg/L	10

3.4.2 Location: STP Outlet Water Sample;

Sr. No.	Parameter	Unit	SPCB Limit	Date of sampling		
				19/01/2022	**07/02/2022**	**09/03/2022**
1	pH @ 25 ° C	--	**6.5-8.5**	7.31	7.25	7.31
2	Total Suspended Solids	mg/L	**30**	16	12	16
3	Residual Chlorine	mg/L	**0.5 Min.**	0.60	0.71	0.67
4	Biochemical Oxygen Demand (BOD)	mg/L	**20**	15	17	15
5	Fecal Coliform	CFU/100ml	**<1000**	44	38	36

3.4.3 Location: ETP Outlet Water Sample;

S.N	Parameter	Unit	SPCB Limit	Date of sampling		
				31/01/2022	**07/02/2022**	**09/03/2022**
1	pH @ 25	--	**6.5 – 8.5**	7.19	7.05	7.09
2	Temperature	° C	**40 Max.**	29	30	30
3	Color	Pt. CO. Scale	**100 Max.**	30	20	29
4	Total Suspended Solids	mg/L	**100 Max.**	14	08	15
5	Oil & Grease	mg/L	**10 Max.**	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)
6	Chemical Oxygen Demand (COD)	mg/L	**100 Max.**	36.1	24.1	28.3
7	Biochemical Oxygen Demand (BOD)	mg/L	**30 Max.**	10	7	9
8	Chloride as Cl^-	mg/L	**600 Max.**	382.8	351.0	367.3
9	Total Dissolved Solids	mg/L	**2100 Max.**	1640	1684	1706
10	Sulphate as SO_4	mg/L	**1000 Max.**	132.4	148.6	155.2
11	Ammonical Nitrogen	mg/L	**50 Max.**	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)
12	% Sodium(Na)	mg/L	**60 Max.**	48.2	45.2	46.0
13	Sodium Absorption Ratio(SAR)	mg/L	**26 Max.**	1.87	1.62	1.8
14	Sulphide as S^{-2}	mg/L	**02 Max.**	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
15	Total Chromium	mg/L	**02 Max.**	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
16	Hexavalent Chromium as Cr+6	mg/L	**0.1 Max.**	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
17	Phosphate as PO_4	mg/L	**5.0 Max.**	0.31	0.28	0.31
18	Copper as Cu	mg/L	**03 Max.**	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
19	Lead as Pb	mg/L	**0.1 Max.**	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)
20	Zinc as Zn	mg/L	**05 Max.**	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
21	Residual Free Chlorine	mg/L	**0.5 Max.**	BDL(MDL:0.2)	BDL(MDL:0.2)	BDL(MDL:0.2)
22	Iron (as Fe)	mg/L	**1.0 Max.**	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)

Note: N.D. = Not Detected, **MDL** = Minimum Detection Limit

3.4.4 Location: Bore-well – 1 to 4 (Nr. Emergency Ash Pond) **Date: 23/03/2022**

Sr.No.	Parameter	Unit	Results			
			Borewell-1	**Borewell-2**	**Borewell-3**	**Borewell-4**
1	pH @ 25 ° C	-	7.69	7.57	7.73	7.63
2	Conductivity (µS)	-	15470	17460	14720	16220
3	Total Dissolved Solids	mg/L	9856	11224	9862	10862
4	Chloride as Cl^-	mg/L	4675	4525.6	4396.5	4495.1
5	Carbonate as CaCO3	mg/L	22.5	27.3	31.5	29.6
6	Bicarbonate as CaCO3	mg/L	214.4	218.3	165.3	184.5
7	Total Alkalinity	mg/L	382.2	405.3	378.6	435.6
8	Calcium as Ca	mg/L	329.5	332.1	296.3	388.5
9	Magnesium as Mg	mg/L	234.1	202.7	167.8	204.5
10	Sodium as Na	mg/L	1495	1956	1244	1590
11	Potassium as K	mg/L	86.7	121.2	70.2	89.5
12	Sulphate as SO4-2	mg/L	597.3	796.5	623.2	725.3
13	Nitrate as NO3	mg/L	27.6	29.5	24.5	28.5
14	Phosphate as PO_4	mg/L	3.15	3.1	2.15	2.5
15	Fluoride as F	mg/L	2.7	2.45	2.5	2.9
16	Mercury as Hg	mg/L	BDL(MDL:0.001)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)
17	Arsenic as As	mg/L	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)
18	Lead as Pb	mg/L	BDL(MDL:0.01)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
19	Chromium as Cr	mg/L	BDL(MDL:0.05)	BDL(MDL:0.003)	BDL(MDL:0.003)	BDL(MDL:0.003)
20	Cadmium as Cd	mg/L	BDL(MDL:0.003)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)
21	Iron (as Fe)	mg/L	BDL(MDL:0.1)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
22	Zinc (as Zn)	mg/L	BDL(MDL:0.05)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)
23	Cobalt as Co	mg/L	BDL(MDL:0.1)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
24	Copper as Cu	mg/L	BDL(MDL:0.05)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)
25	Manganese as Mn	mg/L	BDL(MDL:0.1)	BDL(MDL:0.02)	BDL(MDL:0.02)	BDL(MDL:0.02)
26	Nickel as Ni	mg/L	BDL(MDL:0.02)	BDL(MDL:0.001)	BDL(MDL:0.001)	BDL(MDL:0.001)
27	Salinity	ppt	8.44	8.17	7.94	8.12
28	Barium as Ba	mg/L	N.D.	N.D.	N.D.	N.D.

Note: N.D. = Not Detected, **MDL** = Minimum Detection Limit

3.4.5 Location: Cooling Tower Blow down Water Sample

S.No.	Parameter	Unit	Limit	Results		
				Unit-1	**Unit-2**	**Unit-3**
Date of Sampling →				**16/03/2022**	**16/03/2022**	**16/03/2022**
1	pH @ 25 ° C	--	-	7.69	7.76	7.66
2	Free available Chlorine	° C	Min. 0.5	0.62	0.69	0.63
3	Zinc as Zn	Pt. CO. Scale	1.0	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
4	Hexavalent Chromium as Cr+6	mg/L	0.1	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
5	Total Chromium as Cr	mg/L	0.2	0.059	0.061	0.058
6	Phosphate as P	mg/L	5.0	0.29	0.42	0.32

S.No.	Parameter	Unit	Limit	Results		
				Unit-4	**Unit-5**	**Unit-6**
Date of Sampling →				**16/03/2022**	**16/03/2022**	**16/03/2022**
1	pH @ 25 ° C	--	-	7.83	7.77	7.84
2	Free available Chlorine	° C	Min. 0.5	0.65	0.67	0.64
3	Zinc as Zn	Pt. CO. Scale	1.0	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
4	Hexavalent Chromium as Cr+6	mg/L	0.1	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
5	Total Chromium as Cr	mg/L	0.2	0.060	0.059	0.058
6	Phosphate as P	mg/L	5.0	0.41	0.37	0.33

3.4.6 Location: Condensate Cooling Tower Water Sample						
S.No.	Parameter	Unit	Limit	Results		
				Unit-1	Unit-2	Unit-3
Date of Sampling ⟹				16/03/2022	16/03/2022	16/03/2022
1	pH @ 25 ° C	--	6.5 to 8.5	7.81	7.83	7.93
2	Temperature ^{0}C (Inlet)	^{0}C	--	29.5	29.0	29.0
	Temperature ^{0}C (Outlet)	^{0}C	--	31.0	31.0	30.5
	Temperature ^{0}C (Differential)	^{0}C	7	1.5	2.0	1.5
3	Free available Chlorine	mg/L	Min 0.5	0.82	0.72	0.81

S.No.	Parameter	Unit	Limit	Results		
				Unit-4	Unit-5	Unit-6
Date of Sampling ⟹				16/03/2022	16/03/2022	16/03/2022
1	pH @ 25 ° C	--	6.5 to 8.5	7.96	7.78	7.95
2	Temperature ^{0}C (Inlet)	^{0}C	--	29.0	29.5	29.0
	Temperature ^{0}C (Outlet)	^{0}C	--	31.0	31.0	31.0
	Temperature ^{0}C (Differential)	^{0}C	7	2.0	1.5	2.0
3	Free available Chlorine	mg/L	Min 0.5	0.79	0.81	089

3.4.7 Location: Boiler Blow Down Water Sample					DATE: 23/03/2022	
Parameter	**Unit**	**Limit**	**Results**			
			Unit -1	**Unit -2**	**Unit -3**	**Unit -4**
Total Suspended Solids	mg/L	**100**	BDL(MDL:4.0)	BDL(MDL:4.0)	BDL(MDL:4.0)	BDL(MDL:4.0)
Oil & Grease	mg/L	**10**	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)
Total Copper as Cu	mg/L	**1.0**	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
Total Iron (as Fe)	mg/L	**1.0**	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)

4 AMBIENT NOISE LEVEL MONITORING

The main objective of noise monitoring in the study area is to establish the baseline noise levels and assess the impact of the total noise generated by the operation activities around it. Noise monitoring has been conducted at 10 locations within the periphery of industry premises.

Date of Monitoring: 20-21.01.2022

Result

Sr. No.	**Location**	**Noise Level dB(A)**			
		Sampling Time	**Day Time dB(A) 06 am - 10 pm**	**Sampling Time**	**Night Time dB(A) 10 pm - 06 am**
			Limit 75 dB(A)		**Limit 70 dB(A)**
1.	Nr. LDO Pump House	10:40 am - 12:15 pm	63.0	22:30 pm - 00:15 am	**61.7**
2.	Nr. 20 MLD Plant		64.7		**62.8**
3.	Nr. Pump House		63.6		**62.4**
4.	Nr. Coal Handling plant		65.3		**63.1**
5.	Nr. Gate No.4		59.7		**55.3**
6.	Nr. Integrated Ash Silo		64.7		**62.5**
7.	Nr. Main Gate		63.5		**56.4**
8.	Nr. APCH Building		61.1		**58.5**
9.	Nr. Shantiniketan-I		60.1		**59.6**
10.	**Nr. OHC Building**		**61.5**		**56.7**

Remark: Calibrated instruments were used during monitoring of above identified sample.

Date of Monitoring: 22-23.02.2022

Result

Sr. No.	Location	Noise Level dB(A)			
		Sampling Time	Day Time dB(A) 06 am - 10 pm	Sampling Time	Night Time dB(A) 10 pm - 06 am
			Limit 75 dB(A)		Limit 70 dB(A)
1.	Nr. LDO Pump House	10:20 am - 12:30 pm	63.2	22:40 pm - 00:15 am	**62.7**
2.	Nr. 20 MLD Plant		60.4		**59.9**
3.	Nr. Pump House		61.5		**60.9**
4.	Nr. Coal Handling plant		66.7		**61.5**
5.	Nr. Gate No.4		57.8		**57.3**
6.	Nr. Integrated Ash Silo		63.4		**59.8**
7.	Nr. Main Gate		62.3		**57.6**
8.	Nr. APCH Building		59.4		**55.9**
9.	Nr. Shantiniketan-I		58.2		**57.4**
10.	**Nr. OHC Building**		**61.9**		57.6

Remark: Calibrated instruments were used during monitoring of above identified sample.

Date of Monitoring: 09-10.03.2022

Result

Sr. No.	Location	Noise Level dB(A)			
		Sampling Time	Day Time dB(A) 06 am - 10 pm	Sampling Time	Night Time dB(A) 10 pm - 06 am
			Limit 75 dB(A)		Limit 70 dB(A)
1.	Nr. LDO Pump House	11:10 am - 12:40 pm	61.1	22:30 pm - 00:05 am	**60.4**
2.	Nr. 20 MLD Plant		60.1		**58.2**
3.	Nr. Pump House		62.6		**60.8**
4.	Nr. Coal Handling plant		64.8		**62.8**
5.	Nr. Gate No.4		56.8		**56.5**
6.	Nr. Integrated Ash Silo		63.7		**61.7**
7.	Nr. Main Gate		59.8		**59.3**
8.	Nr. APCH Building		57.2		**55.4**
9.	Nr. Shantiniketan-I		58.5		**53.5**
10.	**Nr. OHC Building**		**60.6**		57.9

Remark: Calibrated instruments were used during monitoring of above identified sample.

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Adani Power (Mundra) Limited, Mundra

Continues Environment Monitoring System Reports (Oct' 2021 TO Mar'2022)

	Unit 1			Unit 2			Unit 3		
Date	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm^3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)
1-Oct-21							29.3	424.0	216.7
2-Oct-21							31.8	431.1	214.1
3-Oct-21							29.6	424.0	214.6
4-Oct-21							30.5	429.1	224.7
5-Oct-21									
6-Oct-21									
7-Oct-21									
8-Oct-21									
9-Oct-21									
10-Oct-21									
11-Oct-21									
12-Oct-21									
13-Oct-21									
14-Oct-21									
15-Oct-21									
16-Oct-21									
17-Oct-21									
18-Oct-21									
19-Oct-21									
20-Oct-21									
21-Oct-21									
22-Oct-21									
23-Oct-21									
24-Oct-21									
25-Oct-21									
26-Oct-21							28.2	435.1	265.6
27-Oct-21							25.4	435.8	252.7
28-Oct-21							25.4	446.1	250.2
29-Oct-21							19.4	301.2	167.7
30-Oct-21									
31-Oct-21									
1-Nov-21									
2-Nov-21									
3-Nov-21									
4-Nov-21									
5-Nov-21									
6-Nov-21									
7-Nov-21									
8-Nov-21									
9-Nov-21									
10-Nov-21									
11-Nov-21									
12-Nov-21									
13-Nov-21							17.9	242.2	128.8
14-Nov-21									
15-Nov-21									
16-Nov-21									
17-Nov-21									
18-Nov-21									
19-Nov-21									
20-Nov-21									
21-Nov-21									
22-Nov-21									
23-Nov-21									
24-Nov-21									
25-Nov-21							22.6	288.9	149.8
26-Nov-21	13.5	187.3	91.7				30.7	431.2	230.5
27-Nov-21	27.0	432.7	217.2				31.3	428.6	225.8
28-Nov-21	23.3	391.8	196.7				29.7	435.5	232.0
29-Nov-21							28.5	428.7	230.0
30-Nov-21							18.9	226.3	118.4

Note : Blank coloum -Unit is in shutdown

Adani Power (Mundra) Limited, Mundra

Continues Environment Monitoring System Reports (Oct' 2021 TO Mar'2022)

	Unit 1			Unit 2			Unit 3		
Date	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm^3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)
1-Dec-21							33.4	434.1	227.8
2-Dec-21	24.0	334.4	168.9	20.3	319.3	177.8	29.4	446.0	238.2
3-Dec-21	26.2	412.7	210.2	23.9	387.3	223.2	31.6	440.2	234.3
4-Dec-21	27.8	472.6	245.1	24.6	433.0	240.7	33.4	460.3	242.9
5-Dec-21	25.5	506.8	273.3	24.1	477.2	273.8	30.4	505.0	284.2
6-Dec-21	25.7	511.7	276.1	19.9	445.4	280.2	30.3	511.4	286.1
7-Dec-21	26.7	518.7	279.0				32.8	501.1	286.5
8-Dec-21	23.1	454.6	243.6				30.6	507.2	285.9
9-Dec-21							29.7	511.7	288.5
10-Dec-21							29.5	508.9	288.0
11-Dec-21							33.8	539.4	286.2
12-Dec-21							33.9	510.0	285.6
13-Dec-21	24.4	459.3	252.4				34.4	511.3	283.1
14-Dec-21	17.4	344.5	188.3				33.3	520.1	286.6
15-Dec-21							33.3	521.6	291.0
16-Dec-21							34.3	511.3	293.0
17-Dec-21							32.6	517.5	296.2
18-Dec-21							31.9	517.9	298.1
19-Dec-21							32.4	520.8	297.1
20-Dec-21							35.3	520.5	294.6
21-Dec-21	26.5	501.6	295.3	22.0	396.7	224.9	35.5	530.0	292.1
22-Dec-21	25.0	485.8	280.5	24.6	504.9	276.4	35.0	515.9	273.5
23-Dec-21	27.2	499.4	293.1	24.8	501.7	296.0	37.5	463.0	258.0
24-Dec-21	28.4	506.0	296.9	26.2	502.7	296.1	40.3	462.1	257.8
25-Dec-21	28.4	500.9	288.6	26.1	497.8	297.4	36.6	481.8	267.3
26-Dec-21	25.5	499.4	287.7	24.9	497.6	294.6	33.6	519.5	286.4
27-Dec-21	25.9	500.3	294.8	25.0	500.6	296.1	33.8	512.8	284.4
28-Dec-21	27.2	498.0	288.7	25.2	498.5	299.0	33.0	499.4	286.3
29-Dec-21	24.5	494.3	292.4	24.1	498.8	300.3	30.9	490.0	289.9
30-Dec-21							30.3	483.8	288.0
31-Dec-21									
1-Jan-22	SD	SD	SD	SD	SD	SD	28.1	420.6	229.3
2-Jan-22	24.1	396.3	218.1	20.5	354.8	205.0	31.8	506.1	276.3
3-Jan-22	29.8	488.0	274.1	26.0	480.2	272.2	35.3	501.0	274.8
4-Jan-22	29.4	487.7	278.4	25.9	477.5	275.0	34.4	500.0	271.5
5-Jan-22	29.5	486.9	272.6	25.8	477.6	273.4	34.7	500.6	271.4
6-Jan-22	26.4	485.7	274.8	25.3	478.4	273.7	31.2	505.4	272.8
7-Jan-22	24.7	488.6	273.7	24.7	478.7	273.6	29.6	533.4	273.8
8-Jan-22	25.0	486.4	270.7	20.7	355.2	204.7	28.7	483.6	290.0
9-Jan-22	24.3	487.6	270.2				26.8	470.3	292.6
10-Jan-22	15.5	274.4	154.0				28.3	492.8	294.5
11-Jan-22							29.6	477.0	294.0
12-Jan-22							17.2	265.2	165.1
13-Jan-22									
14-Jan-22									
15-Jan-22									
16-Jan-22									
17-Jan-22	13.7	186.7	110.8	12.2	180.5	107.3	30.3	416.6	233.1
18-Jan-22	25.7	514.5	289.8	24.4	516.0	308.3	32.1	518.7	288.2
19-Jan-22	24.4	513.0	297.7	23.9	514.8	308.3	30.2	518.3	288.0
20-Jan-22	25.6	513.7	297.8	24.5	519.2	303.0	30.4	520.3	283.1
21-Jan-22	25.3	516.7	294.8	24.4	517.6	309.5	33.7	546.1	279.6
22-Jan-22	24.9	515.1	286.6	25.3	506.8	314.0	30.5	565.9	279.3
23-Jan-22	27.0	515.0	290.7	25.3	510.7	300.2	33.8	567.7	288.7
24-Jan-22	26.3	526.4	308.3	25.4	505.5	297.5	32.1	560.6	291.5
25-Jan-22	24.6	539.1	303.0	25.3	508.2	295.3	29.4	539.9	291.2
26-Jan-22	24.0	548.3	298.3	25.5	507.0	297.8	27.7	533.6	291.2
27-Jan-22	24.4	554.2	299.6	25.4	517.2	307.1	28.3	503.7	290.9
28-Jan-22				25.1	516.2	306.1	31.9	487.3	288.9
29-Jan-22							37.8	483.4	289.5
30-Jan-22							32.8	502.0	289.6
31-Jan-22							33.4	519.3	284.9

Adani Power (Mundra) Limited, Mundra

Continues Environment Monitoring System Reports (Oct' 2021 TO Mar'2022)

	Unit 1			Unit 2			Unit 3		
Date	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm^3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)
1-Feb-22							33.9	547.0	284.2
2-Feb-22							34.5	546.1	282.5
3-Feb-22							34.4	544.7	283.7
4-Feb-22							30.1	547.0	288.3
5-Feb-22							28.1	559.9	290.7
6-Feb-22							28.9	548.9	286.1
7-Feb-22							28.6	556.1	285.5
8-Feb-22							27.9	556.6	282.5
9-Feb-22							28.1	529.3	275.1
10-Feb-22							25.8	482.1	268.0
11-Feb-22							24.6	478.4	270.0
12-Feb-22							25.2	472.8	270.1
13-Feb-22							24.1	519.8	280.6
14-Feb-22							25.3	524.2	284.4
15-Feb-22							25.0	531.0	280.5
16-Feb-22							25.2	499.2	271.5
17-Feb-22							24.4	487.6	275.9
18-Feb-22							24.3	450.9	284.8
19-Feb-22							24.2	433.8	290.4
20-Feb-22							24.0	426.2	293.0
21-Feb-22							24.7	436.9	294.9
22-Feb-22							24.5	456.9	289.9
23-Feb-22							25.4	529.1	271.2
24-Feb-22							28.0	407.2	289.4
25-Feb-22							28.5	430.6	293.3
26-Feb-22							29.5	421.0	288.3
27-Feb-22				21.7	366.1	231.7	28.4	416.5	286.0
28-Feb-22				25.3	493.2	300.8	29.1	420.2	283.7
1-Mar-22	25.3	508.1	288.1	18.5	319.1	199.2	26.0	448.3	274.1
2-Mar-22	17.4	325.0	182.1	SD	SD	SD	26.8	461.3	266.3
3-Mar-22							24.9	456.8	265.0
4-Mar-22							29.7	460.4	264.0
5-Mar-22							28.3	450.7	264.0
6-Mar-22							30.6	465.5	264.0
7-Mar-22	25.8	462.7	253.5	23.3	427.5	241.1	30.6	456.8	266.9
8-Mar-22	29.1	504.6	268.2	25.3	488.7	276.7	33.9	440.0	260.9
9-Mar-22	27.4	505.2	272.8	25.3	485.5	278.0	30.9	429.8	257.1
10-Mar-22	31.1	504.7	270.1	25.3	483.3	280.1	37.9	434.9	255.1
11-Mar-22	32.7	506.1	271.1	25.3	487.3	277.7	41.8	437.9	251.7
12-Mar-22	32.6	508.2	270.2	25.0	491.5	277.2	41.9	441.1	249.0
13-Mar-22	32.3	510.7	275.0	25.6	489.8	277.7	42.0	442.2	247.9
14-Mar-22	32.5	505.9	274.7	25.6	490.7	276.9	42.2	436.5	242.4
15-Mar-22	31.9	505.9	265.9	27.2	493.1	276.1	41.8	438.7	244.7
16-Mar-22	30.3	505.3	269.3	27.1	489.5	275.0	39.6	441.7	246.3
17-Mar-22	26.9	504.1	272.6	25.1	486.2	279.1	33.9	439.2	251.6
18-Mar-22	13.0	236.8	114.5	22.1	408.0	211.2	16.2	162.0	94.3
19-Mar-22	18.1	442.2	209.6				26.0	366.5	208.1
20-Mar-22	26.9	587.1	281.6				35.3	484.3	283.5
21-Mar-22	27.1	563.5	275.9	22.9	420.1	200.6	28.6	475.0	286.7
22-Mar-22	28.0	502.3	260.9	25.3	548.3	276.4	31.7	469.6	290.4
23-Mar-22	32.4	503.9	261.2	28.3	551.9	271.9	36.5	472.2	290.0
24-Mar-22	34.5	507.3	260.6	29.0	551.6	271.9	38.7	473.5	291.1
25-Mar-22	33.4	508.2	261.1	29.7	551.3	273.3	38.7	474.9	287.9
26-Mar-22	31.6	515.1	261.4	28.2	549.2	275.0	34.2	491.3	293.1
27-Mar-22	26.5	521.7	261.5	26.4	529.2	280.5	25.5	476.4	267.3
28-Mar-22	26.7	518.5	261.6	26.7	534.8	272.8	25.1	462.4	245.9
29-Mar-22	27.2	519.5	261.0	27.3	540.9	265.3	28.1	474.6	249.4
30-Mar-22	27.2	520.3	263.6	28.0	534.6	268.2	27.4	481.5	241.7
31-Mar-22	26.4	535.1	278.9	27.1	524.0	276.0	26.2	473.5	231.8

Note : Blank coloum -Unit is in shutdown

Adani Power (Mundra) Limited, Mundra

Continues Environment Monitoring System Reports (Oct' 2021 TO Mar'2022)

	Unit 4			Unit 5			Unit 6		
Date	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)
1-Oct-21	27.2	447.3	230.8						
2-Oct-21									
3-Oct-21									
4-Oct-21									
5-Oct-21				33.5	536.8	247.5			
6-Oct-21				33.9	549.8	253.2	31.6	282.8	210.1
7-Oct-21				34.1	551.3	254.4	33.4	409.4	246.2
8-Oct-21				33.9	540.2	253.2	33.8	549.5	245.6
9-Oct-21				34.6	498.1	244.1	37.0	543.2	241.0
10-Oct-21				34.6	453.6	203.4	35.0	501.6	207.9
11-Oct-21				35.1	459.8	208.3	35.9	505.6	210.8
12-Oct-21				34.6	454.4	204.0	36.0	503.8	208.6
13-Oct-21				34.3	450.5	200.2	35.6	498.6	204.8
14-Oct-21				34.2	444.9	199.3	34.4	494.3	201.9
15-Oct-21				31.5	408.0	173.6			
16-Oct-21				37.1	500.0	227.1			
17-Oct-21				35.1	460.5	208.2	32.2	456.2	184.2
18-Oct-21				34.8	462.0	205.3	34.6	496.1	202.9
19-Oct-21				36.6	473.7	222.8	38.7	527.7	229.7
21-Oct-21				36.6	475.2	222.9	36.2	494.7	202.1
21-Oct-21				36.3	479.3	223.7	40.4	531.0	232.0
22-Oct-21				35.1	460.5	210.9	38.5	507.5	219.7
23-Oct-21				32.8	427.3	180.6	35.0	452.9	190.3
24-Oct-21				32.6	424.4	176.6	34.9	450.8	188.0
25-Oct-21				33.3	426.5	174.2	36.0	452.3	189.5
26-Oct-21	26.1	460.0	221.1	32.4	466.6	206.3	34.4	439.9	222.4
27-Oct-21	24.9	452.6	224.9	31.1	412.3	224.5	33.1	429.8	252.7
28-Oct-21	29.4	451.8	218.3	30.9	417.7	230.6	32.8	427.9	250.8
29-Oct-21	23.3	281.6	143.4	32.1	432.1	240.8	34.8	443.9	267.6
30-Oct-21				30.0	398.2	226.7	32.7	420.6	242.9
31-Oct-21				30.7	414.0	232.5	32.6	419.1	241.4
1-Nov-21				31.1	413.8	231.2	33.0	421.2	244.0
2-Nov-21				30.4	403.6	227.7	32.2	415.1	236.9
3-Nov-21				30.9	429.7	240.4	33.3	426.6	252.1
4-Nov-21				19.7	238.8	139.1			
5-Nov-21									
6-Nov-21									
7-Nov-21									
8-Nov-21									
9-Nov-21									
10-Nov-21									
11-Nov-21									
12-Nov-21									
13-Nov-21	19.6	261.2	143.5						
14-Nov-21									
15-Nov-21	21.5	300.0	145.4						
16-Nov-21									
17-Nov-21									
18-Nov-21	23.9	329.8	154.6						
19-Nov-21	23.3	339.9	158.4						
20-Nov-21									
21-Nov-21									
22-Nov-21									
23-Nov-21	24.0	323.4	160.6						
24-Nov-21	32.4	435.7	222.9						
25-Nov-21	33.2	439.1	227.7						
26-Nov-21	31.9	429.4	222.6						
27-Nov-21	32.4	435.1	222.7						
28-Nov-21	28.9	433.9	227.1						
29-Nov-21	28.7	444.2	234.0						
30-Nov-21	31.5	434.3	221.9						

Note : Blank coloum -Unit is in shutdown

Adani Power (Mundra) Limited, Mundra

Continues Environment Monitoring System Reports (Oct' 2021 TO Mar'2022)

	Unit 4			Unit 5			Unit 6		
Date	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)
1-Dec-21	32.7	443.8	228.6						
2-Dec-21	21.0	268.8	137.6						
3-Dec-21									
4-Dec-21									
5-Dec-21	24.6	356.7	198.5						
6-Dec-21	29.9	482.3	276.0						
7-Dec-21	32.6	482.7	272.3						
8-Dec-21	30.7	488.0	274.5						
9-Dec-21	30.8	486.9	274.4						
10-Dec-21	29.7	484.1	274.9						
11-Dec-21	31.0	484.6	275.4						
12-Dec-21	30.6	482.8	276.7						
13-Dec-21	31.3	487.1	275.6						
14-Dec-21	30.4	481.9	271.7						
15-Dec-21	20.3	275.1	156.6						
16-Dec-21									
17-Dec-21									
18-Dec-21	22.5	330.7	190.5						
19-Dec-21	27.4	479.1	283.6						
20-Dec-21	30.0	487.7	286.6						
21-Dec-21	31.2	489.0	283.9						
22-Dec-21	30.7	492.0	290.4						
23-Dec-21	33.1	486.2	283.5						
24-Dec-21	36.0	488.8	282.7						
25-Dec-21	33.6	489.9	286.0						
26-Dec-21	31.2	492.3	287.5						
27-Dec-21	31.4	474.2	280.6						
28-Dec-21	30.0	478.8	275.6						
29-Dec-21	27.5	482.7	272.2						
30-Dec-21	14.9	230.6	138.1						
31-Dec-21									
1-Jan-22	25.2	344.9	200.8						
2-Jan-22	29.9	462.2	271.7						
3-Jan-22	33.9	469.5	271.8						
4-Jan-22	32.9	473.3	269.5						
5-Jan-22	33.1	469.6	271.7						
6-Jan-22	28.7	469.5	272.0						
7-Jan-22	26.8	464.3	272.6						
8-Jan-22	27.5	459.8	267.2						
9-Jan-22	25.4	457.4	267.7						
10-Jan-22	26.5	453.6	263.8						
11-Jan-22	16.2	242.6	148.3						
12-Jan-22									
13-Jan-22									
14-Jan-22									
15-Jan-22									
16-Jan-22									
17-Jan-22	22.7	274.4	175.2						
18-Jan-22	27.0	417.8	267.8						
19-Jan-22	26.0	421.4	266.3						
20-Jan-22	28.1	464.6	278.7						
21-Jan-22	29.1	519.6	290.1						
22-Jan-22	27.1	517.3	290.8						
23-Jan-22	31.0	506.0	290.9						
24-Jan-22	29.0	504.5	291.3						
25-Jan-22	25.6	500.6	293.4						
26-Jan-22	25.6	488.7	295.6						
27-Jan-22	25.7	478.0	297.4						
28-Jan-22	27.4	471.2	298.4						
29-Jan-22	32.8	474.2	297.1						
30-Jan-22	30.4	479.3	295.7						
31-Jan-22	30.1	499.0	291.5						

Adani Power (Mundra) Limited, Mundra

Continues Environment Monitoring System Reports (Oct' 2021 TO Mar'2022)

	Unit 4			Unit 5			Unit 6		
Date	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)
1-Feb-22	31.6	515.3	289.9						
2-Feb-22	33.9	521.3	289.0						
3-Feb-22	31.0	516.9	290.3						
4-Feb-22	26.9	501.7	291.6						
5-Feb-22	26.5	504.1	291.6						
6-Feb-22	25.9	502.0	292.5						
7-Feb-22	26.2	503.1	291.6						
8-Feb-22	25.9	507.3	290.9						
9-Feb-22	26.0	506.6	290.7						
10-Feb-22	25.1	483.4	295.4						
11-Feb-22	24.9	455.5	300.8						
12-Feb-22	25.8	447.2	302.1						
13-Feb-22	25.6	449.9	300.6						
14-Feb-22	26.0	469.4	295.5						
15-Feb-22	26.9	480.0	293.3						
16-Feb-22	25.6	485.7	286.2						
17-Feb-22	26.5	477.3	267.1						
18-Feb-22	25.6	485.0	277.2						
19-Feb-22	25.7	480.9	273.7						
20-Feb-22	23.9	490.1	274.9						
21-Feb-22	25.9	488.7	269.3						
22-Feb-22	25.9	486.0	274.9						
23-Feb-22	29.2	454.0	267.3						
24-Feb-22	28.5	472.6	276.8						
25-Feb-22	29.1	493.0	278.6						
26-Feb-22	31.8	474.5	267.3						
27-Feb-22	28.2	468.8	267.3						
28-Feb-22	27.8	482.6	269.9						
1-Mar-22	30.5	489.0	272.0						
2-Mar-22	27.4	488.7	270.1						
3-Mar-22	25.5	483.8	270.9						
4-Mar-22	29.9	485.4	269.2						
5-Mar-22	29.6	488.8	270.5						
6-Mar-22	31.6	489.9	267.0						
7-Mar-22	32.4	487.9	271.0						
8-Mar-22	33.6	487.5	281.0						
9-Mar-22	33.9	486.7	272.5						
10-Mar-22	34.9	484.0	266.3						
11-Mar-22	35.6	487.4	272.1						
12-Mar-22	35.8	492.8	271.8						
13-Mar-22	35.7	492.8	273.2						
14-Mar-22	36.1	534.2	293.8						
15-Mar-22	38.2	559.9	292.3	31.4	442.8	246.7	32.3	444.1	236.3
16-Mar-22	35.5	533.5	284.1	33.0	454.8	259.1	35.4	570.4	285.3
17-Mar-22	34.0	485.0	270.5	31.5	448.9	250.7	35.8	557.5	266.2
18-Mar-22	30.1	483.4	265.2	31.4	442.8	246.7	16.6	305.9	125.5
19-Mar-22	30.2	489.0	270.1	30.1	430.7	234.9	27.4	411.4	208.9
20-Mar-22	33.6	481.8	271.3	33.2	454.7	260.2	36.1	489.1	281.0
21-Mar-22	35.9	488.0	269.7	33.7	467.0	281.0	37.5	500.6	310.8
22-Mar-22	34.4	484.8	268.1	32.6	454.0	261.9	35.4	489.6	290.1
23-Mar-22	36.7	491.6	272.4	34.7	474.1	279.6	36.7	495.8	309.4
24-Mar-22	37.7	485.1	266.5	35.1	478.8	283.1	36.4	491.9	319.2
25-Mar-22	37.1	483.9	274.6	34.8	475.7	284.7	36.3	480.5	300.8
26-Mar-22	34.4	494.3	275.6	34.8	465.2	279.8	37.0	475.4	276.1
27-Mar-22	31.0	487.8	272.2	30.8	416.2	236.3	32.3	444.1	236.3
28-Mar-22	31.4	499.0	269.5	30.8	433.2	240.9	32.4	450.3	244.5
29-Mar-22	31.5	495.2	252.9	31.8	442.3	260.7	33.0	472.2	257.4
30-Mar-22	31.9	493.5	243.7	32.5	440.9	249.0	34.5	478.1	248.3
31-Mar-22	32.3	488.9	237.8	32.1	451.8	262.3	34.1	487.5	248.7

Note : Blank coloum -Unit is in shutdown

Adani Power (Mundra) Limited, Mundra

Continues Environment Monitoring System Reports (Oct' 2021 TO Mar'2022)

	Unit 7			Unit 8			Unit 9		
Date	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)
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Note : Blank coloum -Unit is in shutdown

Adani Power (Mundra) Limited, Mundra

Continues Environment Monitoring System Reports (Oct' 2021 TO Mar'2022)

	Unit 7			Unit 8			Unit 9		
Date	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)
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Adani Power (Mundra) Limited, Mundra

Continues Environment Monitoring System Reports (Oct' 2021 TO Mar'2022)

	Unit 7			Unit 8			Unit 9		
Date	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)	PM mg/Nm3 (Avg)	SOx mg/Nm3 (Avg)	NOx mg/Nm3 (Avg)
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Note : Blank coloum -Unit is in shutdown

Annexure - II

Terrestrial Ecology Report (October 2021 to March 2022)

Environment Department,
Adani Power (Mundra) Limited,
Village Tunda & Siracha, Taluka Mundra,
Mundra Kutch, 370 435
Gujarat, India.

List of Abbreviations

APMuL	:	Adani Power (Mundra) Limited, Mundra
CBH	:	Circumference at Breast Height
DBH	:	Diameter at Breast Height
EIA	:	Environmental Impact Assessment
GPS	:	Global Positioning System
H'	:	Shannon-Wiener Diversity Index
Ha	:	Hectare
IUCN	:	International Union for Conservation of Nature
IVI	:	Importance Value Index
MoEF&CC	:	Ministry of Environment, Forest & Climate Change, India
SEZ	:	Special Economic Zone

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1. The Study Area

The Mundra coast falls in Gulf of Kutch, an ecologically important area, supports variety of fishes and birds and other associated ecosystems and hence it is necessary to monitor the ecological environment to know if any changes are happening or not due to the operation activities of power plant.

The study area has been marked as 10 Km radial distance from the existing thermal power plant boundary near village Tunda, Mundra Taluka of Kutch district of Gujarat. The study area around the plant premises comprises of terrestrial ecosystem (Fallow and barren land) and coastal ecosystem (Sea and Creeks). Topography of the study area is plain. Part of Study area falls in notified industrial zone (SEZ).

2. Sampling Period and Sampling Locations

The study has been carried out during the months of **October 2021 to March 2022** in two different seasons comprising post monsoon and winter season.

Sampling locations were selected based on topography, land use, vegetation pattern, etc. as per the objectives and guidelines of MoEF&CC. All observations were taken in and around sampling locations for quantitative representation of different species. List of sampling location for ecological study are given in **Table 1** and Study area map is presented in **Plate 1**.

Table 1: List of Sampling Location

Sr. No.	Name of Location	Aerial Distance from Plant (Approx. Km)	GPS Location
1	Near Siracha Village	2.0	N 22° 50' 21.42" E 69° 33' 46.55"
2	Near Tunda Village	1.5	N 22° 50' 13.58" E 69° 32' 10.31"
3	Near Kandagra Village	3.0	N 22° 50' 22.61" E 69° 31' 32.75"
4	Near Navinal Creek	8.5	N 22° 48' 14.68" E 69° 37' 57.12"
5	Near Vandh Village	0.5	N 22° 48' 44.47" E 69° 32' 33.51"
6	Near Desalpar Village	7.0	N 22° 52' 51.41" E 69° 34' 44.67"
7	Common Intake Channel area	3.8	N 22° 47' 31.75" E 69° 32' 10.51"
8	Outfall Channel and Kotdi creek area	3.5	N 22° 48' 08.66" E 69° 34' 33.75"

Plate 1: Map showing Ecological Sampling Locations around 10 km radial distance

3. Collection of Primary Data

A. Vegetation Diversity

Methodology

The study area is dominated by the vegetation of dry deciduous scrub of small tree, shrub and very few large trees along with agricultural fields towards the northern part. Therefore, the observation of vegetation was made by visiting different sampling stations and accordingly among available plants, the dominant plants species were recorded.

Observation

***Forest Type*:** According to Champion and Seth, the vegetation in the study area can be classified as "VI – B Northern Tropical Forest" Sub type C-I Desert Thorn Forest (Kutch, Saurashtra, Gujarat). The forest patches falling under this category have mono-dominant *Prosopis juliflora*. *Acasia spp., Cassia auriculata Euphorbia spp., Zyziphus mauritiana* and *Zyziphus nummularis* are also found in these scrubs.

***Vegetation Structure and Composition*:** Trees Composition varies considerably in condition, composition, and density with change in location. The vegetation has a very open appearance and is widely spaced with scanty natural growth typical of a saline soil with hot and humid climate mainly composed of co-dominant, thorny trees and shrubs which are xerophytic in nature. The dominant tree species vary from 5-10m in height and tends to be collected in clumps. Regeneration by root suckers is common, especially in *Prosopis* and *Capparis*. The perennial grasses grow in clumps and tussocks (Bunch). There is a thin growth of annual grasses after the rains. They wither after the rainy season.

Vegetation generally occurs near human settlement areas and agricultural bunds. The most dominant species in this region is *Prosopis juliflora*. Other tree species observed are namely *Salvadora oleoides*, *Salvadora persica*, *Phoenix sylvestris* and *Ficus religiosa*. Large horticulture crops of Chiku (*Manilkara zapota*), Coconut (*Cocos nucifera*), Mango (*Mangifera indica*), Guava (*Psidium guajava*) and Date Palm (*Phoenix dactylifera*) are observed near northern part of the study area. Medicinal trees like *Aegle marmelos* (Bel), *Azadirachta indica* (Neem), *Tamarindus indica* (Amli) etc are also commonly observed in the study area.

Plate 2: *Tamarix dioica*

Plate 3:*Solanum xanthocarpum*

Plate 4:*Suaeda Sp.*

Plate 5:*Prosopis juliflora*

The vertical structure of the vegetation shows three distinguished layers i.e. Top, Middle and Ground. *Azadirachta indica, Borassus flabellifer, Ficus bengalensis, Ficus racemosa, Mangifera indica, Tamarindus indica, salvadora persica* etc. comprises top layer of the vegetation.

Salvadora oleoides, Phoenix sylvestris, Cassia auriculata, Capparis deciduas, Pithecellobium dulce, Calotropis procera, Euphorbia nevulia, Prosopis juliflora,

Zizyphus mauritiana, Zizyphus nummularia, Tamarix dioica, etc. forms middle layer of vegetation.

Ground layer vegetation consists of *Aloe vera, Achyranthes aspera, Boerrhavia repens, Citrullus colocynthis, Cynodon dactylon, Ipomoea biloba Indigofera cordifolia, Suaeda fruticosa, Suaeda nudiflora, Solanum xanthocarpum, Tridax procumbens, Sporolobus maderaspatenus* etc.

Dominance, Density and Frequency: The floristic composition assessment of the study area has been evaluated. Phyto sociological studies were carried out by using least count quadrant method. Trees, shrubs and herbs were sampled by taking randomly distributed 10 quadrates of 100 m^2, 25 m^2 and 1 m^2 respectively. The data obtained was further used to estimate Relative Density, Relative Frequency, Relative Dominance and calculation of Importance Value Index (IVI).

Plate 5: Figure showing dry arid thorn forest type (Before Monsson)

The Importance Value Index (IVI) for trees varies between 19.77 and 52.83. The highest IVI of studied tree recorded in study area is of *Prosopis juliflora* (52.83) and lowest IVI recorded is of *Salvadora persica* (19.77) during study period. For shrubs, IVI varies between 8.90 and 31.65. The highest IVI of studied shrubs recorded in study area is of *Cassia auriculata* (31.65) and lowest IVI recorded is of *Zizyphus mauritiana* (8.90) during study period. The undergrowth vegetation (herbs) shows IVI in between 8.88 and 31.05. The highest IVI of studied herbs recorded in study area is of *Salicornia brachiata* (31.05) and lowest IVI recorded is of *Solanum*

xanthocarpum (8.88) during study period. The details of IVI are presented in **Table 2 to 4** for tree shrubs and herbs respectively.

Diversity Index: Diversity means variety or variability. Species diversity therefore refers to the variation that exists among the different living forms. Species indicates the extent of biodiversity in the ecosystem. Species diversity is a statistical abstraction with two components. These are the number of species or richness and evenness or equitability. For better understanding of plant diversity, the Shannon-Wiener diversity index was used. The index considers two important characters of vegetation, i.e. floristic richness and proportional abundance of the species. Diversity index increases with floral spectra (more species means that more wide diversity) which represents actual scenario of ecosystem. The index is given as:

$$H' = -\sum_{i=1}^{s} \text{Pi ln (Pi)}$$

Where H' = Shannon-Wiener diversity index

Pi = Proportional abundance of the i th (individual) species

S = species richness (total number of species present)

ln = natural log (base $_e$)

The species diversity of the study area found to be **2.01, 2.20** and **2.22** for tree, shrub and herbs respectively. The details are presented in **Table 2 to 4** for trees, shrubs and herbs respectively.

Table 2: Study of Diversity Indices for Trees

Scientific Name	IUCN Category	No. of Plots in Sp. Occ.	Total No. Sp.	Total CBH (cm)	Radius (cm)	DBH (cm)	Total Basal Cover (Sq. Meter)	Density/ ha	R-Density	Domin.	R-Domin.	Freq.	R-Freq.	IVI	Pi	ln (Pi)	Pi X Ln (Pi)
Acacia nilotica	NE	15	51	8.12	16.23	0.02	150	7.28	0.21	5.22	0.5	12.20	24.69	0.0728	-2.6198	0.19	15
Azadiracta indica	NE	19	73	11.62	23.23	0.04	190	9.22	0.42	10.69	0.8	19.51	39.43	0.0922	-2.3834	0.22	19
Borassus flabellifer	NE	8	90	14.32	28.64	0.06	80	3.88	0.64	16.25	0.2	4.88	25.01	0.0388	-3.2484	0.13	8
Casuarina equisetifolia	NE	40	23	3.66	7.32	0.00	400	19.42	0.04	1.06	0.2	4.88	25.36	0.1942	-1.6390	0.32	40
Cocos nucifera	NE	24	108	17.19	34.37	0.09	240	11.65	0.93	23.40	0.4	9.76	44.81	0.1165	-2.1498	0.25	24
Mangifera indica	DD	20	60	9.55	19.10	0.03	200	9.71	0.29	7.22	0.5	12.20	29.13	0.0971	-2.3321	0.23	20
Phoenix dactylifera	NE	12	108	17.19	34.37	0.09	120	5.83	0.93	23.40	0.4	9.76	38.98	0.0583	-2.8430	0.17	12
Prosopis juliflora	NE	57	40	6.37	12.73	0.01	570	27.67	0.13	3.21	0.9	21.95	52.83	0.2767	-1.2848	0.36	57
Salvadora persica	NE	11	69	10.98	21.96	0.04	110	5.34	0.38	9.55	0.2	4.88	19.77	0.0534	-2.9300	0.16	11
Total			**206**					**2060**	**100.00**	**3.97**	**100.00**	**4.1**	**100.00**	**300.00**			**2.01**
																Shannon-Wiener	**2.01**

NE: Not Evaluated, **DD:** Data Deficient

Table 3: Study of Diversity Indices for Shrubs

Scientific Name	IUCN Category	No. of Plots in Sp. Occ.	Total No. of Sp.	Density/ ha	Relative Density	Frequency	Relative Frequency	IVI	Pi	ln (Pi)	Pi X Ln (Pi)
Aerva javanica	NE	9	11	28	8.53	0.90	13.04	21.57	0.0853	-2.4619	0.21
Calotropis gigantea	NE	11	8	20	6.20	1.10	15.94	22.14	0.0620	-2.7804	0.17
Calotropis procera	NE	7	15	38	11.63	0.70	10.14	21.77	0.1163	-2.1518	0.25
Capparis deciduas	NE	6	11	28	8.53	0.60	8.70	17.22	0.0853	-2.4619	0.21
Cassia auriculata	NE	9	24	60	18.60	0.90	13.04	31.65	0.1860	-1.6818	0.31
Euphorbia spp.	NE	7	11	28	8.53	0.70	10.14	18.67	0.0853	-2.4619	0.21
Tamarix dioica	NE	6	17	43	13.18	0.60	8.70	21.87	0.1318	-2.0266	0.27
Thevetia peruviana	NE	6	8	20	6.20	0.60	8.70	14.90	0.0620	-2.7804	0.17
Zizyphus mauritiana	NE	4	4	10	3.10	0.40	5.80	8.90	0.0310	-3.4735	0.11
Zizyphus numularia	NE	4	20	50	15.50	0.40	5.80	21.30	0.1550	-1.8641	0.29
		Total	**129**	**323**	**100.00**	**6.90**	**100.00**	**200.00**			**2.20**
										Shannon-Wiener	**2.20**

NE: Not Evaluated, **DD:** Data Deficient

Table 4: Study of Diversity Indices for Herbs

Scientific Name	IUCN Category	No. of Plots in Sp. Occ.	Total No. of Sp.	Density/ ha	Relative Density	Frequency	Relative Frequency	IVI	Pi	ln (Pi)	Pi X Ln (Pi)
Achyranthes aspera	NE	4	13	0.13	8.23	0.4	11.43	19.66	0.0823	-2.4976	0.21
Aloe vera	NE	4	15	0.15	9.49	0.4	11.43	20.92	0.0949	-2.3545	0.22
Boerrhavia diffusa	NE	2	10	0.10	6.33	0.2	5.71	12.04	0.0633	-2.7600	0.17
Citrullus colocynthis	NE	4	17	0.17	10.76	0.4	11.43	22.19	0.1076	-2.2294	0.24
Ipomoea biloba	NE	3	14	0.14	8.86	0.3	8.57	17.43	0.0886	-2.4235	0.21
Salicornia brachiata	NE	4	31	0.31	19.62	0.4	11.43	31.05	0.1962	-1.6286	0.32
Solanum xanthocarpum	NE	2	5	0.05	3.16	0.2	5.71	8.88	0.0316	-3.4532	0.11
Indigofera cordifolia	NE	3	17	0.17	10.76	0.3	8.57	19.33	0.1076	-2.2294	0.24
Sporolobus maderaspatenus	NE	4	21	0.21	13.29	0.4	11.43	24.72	0.1329	-2.0181	0.27
Suaeda fruticosa	NE	5	15	0.15	9.49	0.5	14.29	23.78	0.0949	-2.3545	0.22
Tridax procumbens	NE	4	13	0.13	8.23	0.4	11.43	19.66	0.0823	-2.4976	0.21
		Total	**158**	**1.58**	**100.00**	**3.5**	**100.00**	**200.00**			**2.22**
										Shannon-Wiener	**2.22**

NE: Not Evaluated, **DD:** Data Deficient

B. Faunal Diversity

Methodology

For animals, since they are capable of moving from one place to another, this makes their study entirely different. Therefore, specific methods were adopted for counting these animals in the field. The on-site information (observation and interview with local people) collected during survey was further enriched by the information collected from different secondary sources.

Observation

***Mammals*:** The diversity in fauna basically depends upon density and diversity of flora. The richer the diversity among the flora better will be the diversity in fauna. Present conditions (sparse, dry and thorny vegetation) of the area do not support higher mammals, however animals like Fox and Jackal are commonly observed. Vermin animals like Nilgai, Wild Boar and Hare also observed from the study area. **Plate-4** shows the mammals observed during the study.

***Reptiles and amphibians*:** Area is devoid of good agricultural land, however standing orchards of coconut, mango and chiku attracts many rodents and birds, which ultimately attracts many reptiles and amphibians. Lizards such as monitor lizard and garden lizards and Mojave fringe-toed lizard are observed in the study area. The faunal elements observed in the study area during this period are given in **Table 5.**

Table 5: Fauna Observed in the Study Area

Sr. No.	Common Name	Scientific Name	IUCN Red List Category	Wildlife Schedule The Indian Wildlife (Protection) Act, 1972
	Mammals			
1	Nilgai	*Boselaphus tragocamelus*	*LC*	Schedule III
2	Indian Jackal	*Canis aureus*	*LC*	Schedule II
3	Common Mongoose	*Herpestes edwardsii*	*LC*	Schedule II
4	Indian Hare	*Lepus nigricollis*	*LC*	Schedule IV
5	Wild Boar	*Sus scrofa*	*LC*	Schedule III
6	Camel	*Camelus bactrianus*	*LC*	Schedule IV
7	Palm squirrel	*Funambulus pennanti*	*LC*	Schedule IV
8	Fruit Bat	*Cyanopterus sphynx*	*LC*	Schedule V
	Reptiles			
1	Garden lizard	*Calotes versicolor*	NE	-
2	Indian Monitor lizard	*Varanus bengalensis*	LC	Schedule II
3	Fan-throated lizard	*Sitana ponticeriana*	LC	Schedule IV
4	Indian cobra	*Naja naja*	LC	Schedule II: Part – II
5	Python	*Python molurus*	NT	Schedule I: Part – II
6	Spiny-tailed Lizard	*Uromastix hardwickii*	LC	Schedule II
7	Indian FringeToed Lizard	*Acanthodactylus cantoris*	LC	Schedule IV
8	John Sand Boa	*Eryx johni*	LC	Schedule IV

	Amphibians			
1	Indian Skipping Frog	*Euphlyctis cyanophlyctis*	LC	Schedule IV
2	Indian bullfrog	*Hoplobatrachus tigerinus*	LC	Schedule IV

LC: Least Concern, **NT:** Near Threatened, **NE:** Not Evaluated.

C. Avifauna

Methodology

For survey of the birds, the area around APMUL power plant and adjacent areas of the study area was carried out from **October 2021 to March 2022**. Birds were observed once a week. A working day was divided into two parts, *viz*., morning (0600 to 0800hr) and afternoon (1700 to 1900hr). Existing roads, bridle paths, embankments, cattle trails, plantation areas, shore lines, canal and pond banks, etc., were used to cover the study area. The trail length varied from 500m to 1000m and the visibility of these trails was 50m to 100m width on both sides. All types of habitats were visited weekly. Maximum field visits were carried on foot but sometimes vehicles were also used to cover long distance of the study area. Birds were observed either by a pair of binoculars (**Nikon Action 8x40CF**) or by naked eyes depending on the distance of the object. Long notes were taken on whether the observed birds were singing, feeding or flying over. For identification, external morphology and other modes i.e., colour, size, shape, flight, walk, habitat, call, and sitting postures were considered, followed by the use of Field guide by Ali (1996), Ali and Ripley (1983). A camera camera (**Nikon Coolpix P900**) with **83x zoom** lens was used for photography.

The estimates of the survey provide an index of the various species of birds in the study area and allow species comparison between them. For better understanding of avian diversity, the Shannon-Wiener diversity index was used. The index considers two important characters of birds, i.e. its richness and proportional abundance of the species. Diversity index increases with the avian spectra (more species means that more wide diversity) which represents actual scenario of ecosystem. The index is given as:

$$H' = -\sum_{i=1}^{s} \text{Pi ln (Pi)}$$

Where H' = Shannon-Wiener diversity index
Pi = Proportional abundance of the i th (individual) species
S = species richness (total number of species present)
ln = natural log (base $_e$)

Observation

Mundra coast provides very good grounds for roosting and food to the avifauna. The coastal wetlands in Mundra coast with broad intertidal mudflats, mangroves and salt pans offer a great diversity of habitats for birds to utilize for roosting, nesting and breeding.

The study area supports three habitat types of birds namely water birds, grassland birds and coastal birds. The birds like Mynas, Crows, Sparrows, Bulbuls, Babblers and Pigeons were commonly observed in and around villages. Areas with or near the agriculture fields, grain eating herbivorous species were dominant. These species includes Doves, Sparrows, Pigeons, etc. Insectivorous bird species viz. Bee-Eaters, Bulbuls, Wagtails, Desert Wheatears, Drongos, etc. were observed in the study area. Fruit eating birds like Bulbuls, Mynas and Sunbirds usually observed near the village settlements. Water habitat and fish eating birds like Curlews, Kingfishers, Herons, Lapwings, Plovers, Sandpipers, Indian Rollers, and Egrets were observed near the water bodies and in low-lying marshy areas. View of migratory birds & resident birds observed in the study area are shown in **(Plate 5 to 8)**. List of birds observed during the study period in the study area are given in **Table 6**.

The Shannon Weiner Diversity Index for birds in the study area is found to be **4.09** during this period and total 5628 birds were recorded during the monitoring. The Species richness for the study area is found to be **71.** Proportional abundance of the individual species varies between 0.0115 and 0.0480. The highest abundance recorded was of **Blue Rock Pigeon (*Columba livia*)** (0.0480) and the lowest recorded were of Black-Tailed Godwit (***Limosa limosa***) & Little Stint **(*Calidris minuta*)** (0.0115) which is observed in study area for the first time ever. The details are presented in **Table 6**.

Black Drongo (*Dicrurus macrocercus*)

Black Necked Strok (*Ephippiorhynchus asiaticus*)

Black-Headed ibis (*Threskiornis melanocephalus*)

Black-Shouldered Kite (*Elanus caeruleus*)

Black-Winged Stilt (*Himantopus himantopus*)

Common Redshank (*Tringa totanus*)

Plate 7: Birds Observed in the Study Area of 10 Km

Common Crane (*Grus grus*)

Common Crested Lark (*Galerida cristata*)

Common Greenshank (*Tringa nebularia*)

Common Coot (*Fulica atra*)

Dalmatian Pelican (*Pelecanus crispus*)

Desert Wheatear (*Oenanthe deserti*)

Plate 8: Birds Observed in the Study Area of 10 Km

Eurasian Whimbrel (*Numenius phaeopus*)

Great Stone Plover (*Esacus recurvirostris*)

Great White Pelican (*Pelecanus onocrotalus*)

Greater Flamingo (*Phoenicopterus roseus*)

Gull Billed Tern (*Gelochelidon nilotica*)

Heuglin's Gull (*Larus heuglini*)

Plate 9: Birds Observed in the Study Area of 10 Km

House Sparrow (*Passer domesticus*)

Little Cormorant (*Microcarbo niger*)

Little Stint (*Calidris minuta*)

Little tern (*Sternula albifrons*)

Northen Pintail (*Anas acuta*)

Painted Stork (*Mycteria leucocephala*)

Plate 10: Resident Birds Observed in the Study Area of 10 Km

Spot billed duck (*Anas poecilorhyncha*)

Western Reef Heron (*Egretta gularis*)

Wire-tailed Swallow (*Hirundo smithii*)

Plate 11: Resident Birds Observed in the Study Area of 10 Km

Table 6: Study of Diversity Indices for Birds (Avi-Fauna)

Sr. No.	Common Name	Scientific Name	IUCN Category	Wildlife Schedule	Total	Pi	ln Pi	SWI
1	Asian Koel	Eudynamys scolopaceus	LC	Schedule IV	40	0.0071	-4.947	0.0352
2	Black-Tailed Godwit	Limosa limosa	NT	Schedule IV	6	0.0011	-6.844	0.0073
3	Black-crowned sparrow-lark	Eremopterix nigriceps	LC	Schedule IV	65	0.0115	-4.461	0.0515
4	Black Drongo	Dicrurus macrocercus	LC	Schedule IV	119	0.0211	-3.856	0.0815
5	Black Headed Gull	Chroicocephalus ridibundus	LC	Schedule IV	97	0.0172	-4.061	0.0700
6	Black Ibis/Glossy Ibis	Pseudibis papillosa	LC	Schedule IV	56	0.0100	-4.61	0.0459
7	Black Necked Strok	Ephippiorhynchus asiaticus	NT	Schedule IV	34	0.0060	-5.109	0.0309
8	Black-Winged Stilt	Himantopus himantopus	LC	Schedule IV	146	0.0259	-3.652	0.0947
9	Black-Shouldered Kite	Elanus caeruleus	LC	Schedule IV	55	0.0098	-4.628	0.0452
10	Blue Cheeked Bee Eater	Merops persicus	LC	Schedule IV	82	0.0146	-4.229	0.0616
11	Blue Rock Pigeon	Columba livia neglecta	NE	Schedule IV	270	0.0480	-3.037	0.1457
12	Brahminy Starling	Sturnia pagodarum	NE	Schedule IV	35	0.0062	-5.08	0.0316
13	Cattle Egret	Bubulcus ibis	LC	Schedule IV	151	0.0268	-3.618	0.0971
14	Common Babbler	Turdoides caudata	LC	Schedule IV	105	0.0187	-3.982	0.0743
15	Common Coot	Fulica atra	LC	Schedule IV	154	0.0274	-3.599	0.0985
16	Common Crane	Grus grus	LC	Schedule IV	128	0.0227	-3.783	0.0860
17	Common Crested Lark	Galerida cristata	LC	Schedule IV	52	0.0092	-4.684	0.0433
18	Common Hoopoe	Upupa epops	LC	Schedule IV	33	0.0059	-5.139	0.0301
19	Common Iora	Aegithina tiphia	LC	Schedule IV	35	0.0062	-5.08	0.0316
20	Common Myna	Acridotheres tristis	LC	Schedule IV	72	0.0128	-4.359	0.0558
21	Common Quail	Coturnix coturnix	LC	Schedule IV	48	0.0085	-4.764	0.0406
22	Common Redshank	Tringa totanus	LC	Schedule IV	68	0.0121	-4.416	0.0534
23	Common Greenshank	Tringa nebularia	LC	Schedule IV	72	0.0128	-4.359	0.0558
24	Common Swallow	Hirundo rustica	LC	Schedule IV	90	0.0160	-4.136	0.0661
25	Common Teal	Anas crecca	LC	Schedule IV	96	0.0171	-4.071	0.0694
26	Dalmatian Pelican	Pelecanus crispus	LC	Schedule IV	108	0.0192	-3.953	0.0759
27	Demoiselle crane	Anthropoides virgo	LC	Schedule IV	155	0.0275	-3.592	0.0989
28	Great White Pelican	Pelecanus onocrotalus	LC	Schedule IV	52	0.0092	-4.684	0.0433
29	Desert Wheatear	Oenanthe deserti	LC	Schedule IV	60	0.0107	-4.541	0.0484
30	Great Stone Plover	Esacus recurvirostris	NT	Schedule IV	126	0.0224	-3.799	0.0851
31	Eurasian Collared Dove	Streptopelia decaocto	LC	Schedule IV	131	0.0233	-3.76	0.0875
32	Eurasian Curlew	Numenius arquata	NT	Schedule IV	13	0.0023	-6.071	0.0140
33	Eurasian Spoonbill	Platalea leucorodia	LC	Schedule IV	94	0.0167	-4.092	0.0683
34	Eurasian Whimbrel	Numenius phaeopus	LC	Schedule IV	34	0.0060	-5.109	0.0309
35	Greater Flamingo	Phoenicopterus roseus	LC	Schedule IV	125	0.0222	-3.807	0.0846
36	Greater Short-toed Lark	Calandrella brachydactyla	LC	Schedule IV	48	0.0085	-4.764	0.0406
37	Green Bee Eater	Merops orientalis	LC	Schedule IV	90	0.0160	-4.136	0.0661

38	Green Sandpiper	Tringa ochropus	LC	Schedule IV	18	0.0032	-5.745	0.0184
39	Grey Heron	Ardea cinerea	LC	Schedule IV	69	0.0123	-4.401	0.0540
40	Grey Francolin	Francolinus pondicerianus	LC	Schedule IV	77	0.0137	-4.292	0.0587
41	Gull Billed Tern	Gelochelidon nilotica	LC	Schedule IV	98	0.0174	-4.051	0.0705
42	Heuglin's Gull	Larus heuglini	LC	Schedule IV	58	0.0103	-4.575	0.0471
43	House Crow	Corvus splendens	LC	Schedule V	101	0.0179	-4.02	0.0721
44	House Sparrow	Passer domesticus	LC	Schedule IV	263	0.0467	-3.063	0.1432
45	Indian Pond Heron	Ardeola grayii	LC	Schedule IV	58	0.0103	-4.575	0.0471
46	Indian Robin	Saxicoloides fulicatus	LC	Schedule IV	58	0.0103	-4.575	0.0471
47	Indian Roller/ Neelkanth	Coracias benghalensis	LC	Schedule IV	57	0.0101	-4.592	0.0465
48	Large Egret	Ardea alba	LC	Schedule IV	101	0.0179	-4.02	0.0721
49	Laughing Dove	Spilopelia senegalensis	LC	Schedule IV	116	0.0206	-3.882	0.0800
50	Little Cormorant	Microcarbo niger	LC	Schedule IV	80	0.0142	-4.253	0.0605
51	Little Tern	Sternula albifrons	LC	Schedule IV	119	0.0211	-3.856	0.0815
52	Little Stint	Calidris minuta	LC	Schedule IV	6	0.0011	-6.844	0.0073
53	Northen Pintail	Anas acuta	LC	Schedule IV	65	0.0115	-4.461	0.0515
54	Oriental White Ibis / Black-Headed ibis	Threskiornis melanocephalus	NT	Schedule IV	69	0.0123	-4.401	0.0540
55	Painted Stork	Mycteria leucocephala	NT	Schedule IV	164	0.0291	-3.536	0.1030
56	Purple Sunbird	Nectarinia asiatica	LC	Schedule IV	74	0.0131	-4.331	0.0570
57	Pied Kingfisher	Ceryle rudis	LC	Schedule IV	35	0.0062	-5.08	0.0316
58	Red Vented Bulbul	Pycnonotus cafer	LC	Schedule IV	105	0.0187	-3.982	0.0743
59	Red Wattled Lapwing	Vanellus indicus	LC	Schedule IV	83	0.0147	-4.217	0.0622
60	Ring Dove	Streptopelia capicola	LC	Schedule IV	56	0.0100	-4.61	0.0459
61	Rose-Ringed Parakeet	Psittacula krameri	LC	Schedule IV	50	0.0089	-4.723	0.0420
62	Shikra	Accipiter badius	LC	Schedule IV	17	0.0030	-5.802	0.0175
63	Small Blue Kingfisher	Alcedo atthis	LC	Schedule IV	48	0.0085	-4.764	0.0406
64	Snake Bird/ Darter	Anhinga melanogaster	NT	Schedule IV	12	0.0021	-6.151	0.0131
65	Spot billed duck	Anas poecilorhyncha	LC	Schedule IV	81	0.0144	-4.241	0.0610
66	Western Reef Heron	Egretta gularis	LC	Schedule IV	55	0.0098	-4.628	0.0452
67	White Breasted Kingfisher	Halcyon smyrnensis	LC	Schedule IV	49	0.0087	-4.744	0.0413
68	White Wagtail	Motacilla alba	LC	Schedule IV	52	0.0092	-4.684	0.0433
69	White-Eared Bulbul	Pycnonotus leucotis	LC	Schedule IV	66	0.0117	-4.446	0.0521
70	White-Throated Munia	Lonchura malabarica	LC	Schedule IV	74	0.0131	-4.331	0.0570
71	Wire-tailed Swallow	Hirundo smithii	LC	Schedule IV	51	0.0091	-4.704	0.0426
Total					**5628**			**4.09**
Shannon Wiener								**4.09**

LC: Least Concern, **NT:** Near Threatened.

4. Green Belt Activities

Horticulture Department of Adani Power (Mundra) Limited, Mundra has taken many steps to develop plantation in and around the power plant premises.
The main objectives are:

- To improve the soil fertility
- To reduce the use of chemical fertilizers,
- To produce organic manure facility by utilizing the fly ash

To achieve the above objectives, APMuL Mundra had constructed Vermicompost which is useful for growth of plants. From October 2021 to March 2022 total 242.62 MT of Vermicompost manure was produced and all are utilized in development of greenbelt in the plant premises. In addition to this Environment department had developed an Eco-Park, which is prepared with waste and reusable material. It spreads in 4.1366 ha of land. Eco-Park is based on Concept 4-R: Reduce, Reuse, Recover and Recycle. Eco-Park has an Organic Waste converter unit which converts kitchen waste into organic compost. From October 2021 to March 2022 total 2634 kg of organic manure was produced from kitchen waste.

New nursery is established to cater the needs of new plantation and gap filing activities. Native trees species plantation are carried out to suppress the dust and for maintaining the aesthetic beauty of the region. The tree species include Azadirachta indica, Casuarina equisetifolium, Jatropha, Salvadora oleoides and Cocos nucifera were recently planted for greenbelt development. Plant species planted for landscaping are mainly evergreen species. These are Caesalpinia pulcherrima, Ficua Panda, Hibiscus rosa-sinensis, Ixora hybrid and Plumeria alba. Many orchard species are also grown inside the plant premises such as mango, chicku, Sapota and pomegranate.

The greenbelt details regarding area, species, and number of trees, palm & shrubs planted is given in Annexure: III.

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Annexure - III

MARINE MONITORING REPORT

March 2022

FOR

M/s. ADANI POWER (MUNDRA) LIMITED

At

Tunda & Siracha,
Tal. Mundra, Dist.: Kutch.
KUTCH, GUJARAT – 370 435

Prepared by

UniStar
Environment & Research Labs Pvt. Ltd.

PREFACE

M/s. Adani Power (Mundra) Limited (APMuL) is a subsidiary company of Adani Group engaged in imported coal-based thermal power generation located near village Tunda and Siracha, Taluka Mundra District Kutch, Gujarat. APMuL has commissioned the first supercritical 660 MW unit in the country. This is also the World's First supercritical technology project to have received the 'Clean Development Mechanism (CDM) Project' certification from United Nations Framework Convention on Climate Change (UNFCCC). Currently, the total power production capacity of the APMuL has increased to 4620 MW.

APMuL has engaged **M/s. UniStar Environment and Research Labs Pvt. Ltd., Vapi** to **carry out the** seasonal Marine Monitoring Study along with the seawater intake and outfall (discharge) channels of Mundra power plant. This marine monitoring study involved the assessment of Physio-chemical parameters at the earlier prescribed locations. The distribution and diversity of marine flora and fauna were assessed through water sampling from sub-tidal regions. Furthermore, the distribution of the benthic community was evaluated from the sediment samples collected along the sub-tidal and inter-tidal regions. The overall objective of this study is to monitor the status of prevailing ecology along the intake and discharge (outfall) channels, in terms of water and sediment quality through assessment of physico-chemical parameters and marine biota. This marine monitoring report provides a comprehensive analysis of the Data obtained through a monitoring study undertaken during March 2022.

Date: 28/03/2022

M/S.UniStar Environment and Research Labs Pvt. Ltd.

White House, Char Rasta,

Vapi-396 191

Sampling by	Report Prepared By	Approved by
		
(Bhavin Patel)	**(Shweta Rana)**	**(Jaivik Tandel)**

adani

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1. INTRODUCTION

1.1 OVERVIEW

Adani Power (Mundra) Limited (APMuL) is an imported coal-based thermal power plant located near village Tunda and Siracha, Taluka Mundra, District Kutch, Gujarat, India. APMuL is the largest single location private coal-based power plant in the world. Mundra plant capacity is 4620 MW, comprising of 9 units with 4 units of 330 MW (Phase I and II) and 5 units of 660MW (Phase III and IV). The 330 MW units are based on subcritical technology and the 660 MW units are based on supercritical technology. APMuL has created history by synchronizing the first super-critical technology based 660MW generating unit. This is not only the first super-critical generating unit in the country but also the fastest project implementation ever by any power developer in the country. The Phase III of the Mundra project, which is based on supercritical technology, has received the 'Clean Development Mechanism (CDM) Project' certification from United Nations Framework Convention on Climate Change (UNFCCC).

M/S. UniStar Environment and Research Labs Pvt. Ltd., Vapi, India have carried out the routine Marine Monitoring Study in the vicinity of the APMuL Mundra plant. The sampling was carried out along the sea intake channel (2 stations) and discharge/outfall water mixing (3 stations) region. This assessment involves the collection of physico-chemical parameters from 5 subtidal locations (Table 1). The distribution and diversity of marine microflora (phytoplankton and pigments) and fauna (zooplankton) were assessed from water samples collected from 5 subtidal stations (Table 1). The assemblage of the microbenthic community was studied from 5 sub-tidal and 3 inter-tidal stations. The Outfall Channel of the APMuL was closed due to maintenance work since September 2021 and just started in March 2022. Thus, this report presents the detailed account of the results observed during the Marine Monitoring Study at the vicinity of the APMuL.

1.2 OBJECTIVES

a) To analyses the physico-chemical seawater parameter for understanding the water quality in the study area.

b) Estimation of the selected trace metals concentrations from sediment samples.

c) Evaluation of the prevailing status of marine biota through the quantitative and qualitative analysis of marine flora (phytoplankton and pigments) and fauna (zooplankton and macrobenthos).

d) To recommend adequate marine environmental management measures.

2. STUDY PROGRAM

2.1 STUDY PERIOD

The field investigation was carried out on 28 and 29 March 2022. The sampling strategy was planned in such a manner as to get a detailed characteristic of the marine environment of the study area. Sampling and analysis for the marine environment have been carried out by **M/S. UniStar Environment and Research Labs Pvt. Ltd, Vapi, India**.

2.2 SAMPLING LOCATIONS

Sampling was carried out at 5 subtidal stations and 3 intertidal transects along with the sea intake and outfall channels. Out of 5 subtidal stations, 2 were located in the sea intake channel and 3 along the discharge mixing (outfall channel) region. One intertidal station was located along the sea intake channel and 2 were along the discharge region. The detailed geographic coordinates of sampling stations are given in Table 1 and Figure 1.1.

Table 1: Geographic coordinates, water, and sediment parameters at the subtidal sampling stations, APMuL during March 2022.

Subtidal station							
Station	**Station code**	**Locations**	**Coordinates**		**Water depth**	**Tide**	**Sediment texture**
1	St-1	Intake point	22°48’ 30.’50”N	69°32’57.84”E	7 m	Flood	Silty-sand
2	St-2	Mouth of intake point	22°47’07.20 ”N	69°32’06.50”E	8.1 m	Flood	Silty-sand
3	St-3	West port area	22°45’27.70 ”N	69°34’50.63”E	7.6 m	Ebb	Silty-sand
4	St-4	Outfall area	22°44’ 40.56”N	69°36’26.61”E	4.0 m	Ebb	Silty clay
5	St-5	Outfall area	22°45’12.60 ”N	69°36’44.54”E	4.2 m	Ebb	Silty clay

Table 2: Geographic coordinates, water, and sediment parameters at the inertial sampling stations, APMuL during March 2022.

Intertidal transect						
Station	**Station code**	**Tide Level**	**Coordinates**	**Water depth**	**Intertidal exposed area**	**Sediment texture**
I	IT-1 (HW)	High Tidewater level	22°47'07.55" N	69°32'16.91" E	12 m	Silty-sand
	IT-1 (LW)	Low Tide water level	22°47'06.38"N	69°32'11.62"E		Silty-sand
II	IT-2 (HW)	High Tide water level	22°45'58.72" N	69°34'35.41" E	12.6 m	Silty-Sandy
	IT-2 (LW)	Low Tidewater level	22°45'57.74" N	69°34'35.05" E		Silty-sand
III	IT-3 (HW)	High Tidewater level	22°44' 52.21" N	69°36'41.64"E	11 m	Sandy
	IT-3 (LW)	Low Tidewater level	22°44' 51.23" N	69°36'39.28" E		Sandy

Figure 1: Map of the study area illustrating the subtidal and intertidal sampling stations.

2.3 SAMPLING STRATEGY

2.3.1 Sampling frequency

A sampling at the subtidal stations was carried out during the flood to ebb tides. Surface and bottom water samples were collected in duplicate for assessing water quality and marine biota. Intertidal samples were collected in duplicate during low tide at each transect.

2.3.2 Sampling methodology

For estimation of physico-chemical parameters and marine flora (phytoplankton and pigments), subsurface samples were collected using the Niskin water sampler (5-litre capacity) with a mechanism for closing at the desired depth. Surface water samples were collected using a clean polyethylene bucket. Phytoplankton samples were collected in clean polyethylene bottles (1 L) fitted with inert cap liners and preserved with 4% Lugol's iodine solution. For pigment analysis, water samples were stored in the clean, dark polyethylene cans (5 L). Chemical parameters samples were collected in polyethylene or glass bottles. Samples for phenol were collected in polyethylene or glass bottles and PHs collected in glass bottles. Dissolve oxygen (DO) samples were collected in glass BOD bottle and Biological Oxygen Demand (BOD) samples were collected in polyethylene or glass bottle. The temperature was measured on the field with a calibrated thermometer. Analysis of other parameters was carried out in the laboratory.

For zooplankton oblique hauls were made using Heron Tranter net attached with calibrated flow meter. Samples were stored in clean polyethylene bottles (0.5 L) and fixed with 5% formaldehyde.

For the analysis of macrobenthos, subtidal sediment samples were collected using a Van Veen grab covering an area of 0.04 m^2. Intertidal samples were collected using a metal quadrant. Samples were sieved with a 500 µ metal sieve and preserved with Rose Bengal-formalin solution and stored in plastic zip-lock bags.

2.4 SAMPLE ANALYSIS METHODS

2.4.1 Physico-chemical parameter:

Samples were analysed by using different analytical methods for estimations of Temperature, Turbidity, PH, SS, Salinity, DO, BOD, COD, Phosphate, Total nitrogen, Nitrite,

Nitrate, Phenols and PHc. The standard methods used for the analysis of each parameter are given in Table 3.

2.4.2 Sediment Quality parameters:

Sediment texture, Petroleum Hydrocarbon (PHc), Phosphorus, Organic Carbon, Aluminium, Iron, Chromium, Nickel, Zinc, Lead, Copper, Cobalt, Cadmium, Mercury, Arsenic. The standard methods used for the analysis of each parameter are given in Table 3.

2.4.3 Biological parameters:

2.4.3a Phytoplankton:

The Lugol's preserved samples were allowed to settle for 48-72 hrs. The identification and enumeration of phytoplankton cells were carried out under a compound microscope using the Sedgwick Rafter slide. Species were identified to the genus level.

2.4.3b Phytoplankton pigments:

For the estimation of Chlorophyll *a* (Chl*a*) and Pheophytin, a known volume of field-collected water samples was filtered through Whatman glass microfiber filters (GF/F: 47 mm) and paper was macerated in 90% acetone and one night stored in the dark at 4ºC. For estimation of Chl*a* fluorescence of extract was measured using Turner Fluorometer. For phaeophytin fluorescence was measured after acidification with 0.1 N HCl.

2.4.3c Zooplankton:

Formalin preserved sample was divided into 4 equal portions using the Folsom Plankton Splitter. One portion of samples was used to determine biomass using the volume displacement method. Another portion was used for enumeration and identification of (25-50%) faunal composition.

For quantification of zooplankton, 4-5 ml of the sample was taken in a zooplankton counting chamber. The identification was carried out under Stereomicroscope. The zooplanktons were identified at the group level.

2.4.3d Benthos:

For enumeration and identification of the macrobenthos, the organisms were handpicked using forceps and a paintbrush. After sorting, organisms were preserved in 10% formalin. Identification of the organisms was done to the group level under a stereomicroscope.

3 WATER QUALITY MONITORING

3.1 RESULT OF PHYSICO-CHEMICAL WATER PARAMETER ANALYSIS

The samples collected during the field visit were brought to the laboratory for further analysis of physico-chemical parameters. The slandered methods used for the analysis of water quality parameters are given in Table 3

Table 3: Water quality parameters and their test methods.

Sr. No.	Parameters	Station 1		Station 2		Test Method Permissible
		Surface	Bottom	Surface	Bottom	
PHYSICAL QUALITY						
1.	pH @ 25 ° C	7.98	8.01	8.02	8.08	IS 3025(Part 11)1983
2.	Temperature (^{0}C)	30	29	30	30	IS 3025(Part 9)1984
3.	Turbidity (NTU)	1.2	1.6	1.4	1.9	IS 3025(Part 10)1984
CHEMICAL QUALITY						
1.	Total Suspended Solids (mg/l)	24	30	24.3	34.2	(APHA 23rd Ed.,2017,2540- D)
2.	Biochemical Oxygen Demand (BOD) (mg/l)	5.2	5.8	5.5	5.4	IS 3025(Part 44)1993Amd.01
3.	Sulphate as SO_4(mg/l)	3046	2602	2760	2430	(APHA 23rd Ed.,2017,4500- SO4 E)
4.	Ammonical Nitrogen(µmol/l)	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	(APHA 23rd Ed.,2017,4500- NH3 B)
5.	Salinity	36.3	37.3	36.5	37.2	By Calculation
6.	Dissolved Oxygen (mg/l)	6.1	5.4	6.1	5.7	IS 3025(Part 38)1989,
7.	Total Nitrogen (µmol/l)	4.0	4.2	4.3	4.5	(APHA 23rd Ed.,2017,4500-O,B),
8.	PO_4^3-P (µmol/l)	0.39	0.16	0.17	0.18	APHA 23rd Ed.,2017,4500 NH3 – B
9.	(NO_3-N)e (µmol/l)	0.9	0.8	0.9	1.02	(APHA 23rd Ed.,2017,4500-P,D)
10.	(NO_2-N) Nitrite (µmol/l)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)	(APHA 23rd Ed.,2017,4500 NO3-B)
11.	Phenol(µmol/l)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	APHA 23rd Ed.,2017,4500NO2B
12.	PHc (ppb)	N.D.	N.D.	N.D.	N.D.	IS 3025(Part 43)1992Amd.02

Note: MDL = Minimum Detection Limit (MDL: 0.01) and N.D. = Not detectable

Table 3 (Continued 2)

Sr. No	Parameters	Station 3		Station 4		Test Method Permissible
		Surface	Bottom	Surface	Bottom	
PHYSICAL QUALITY						
1.	pH @ 25 ° C	8.0	8.16	7.95	8.07	IS 3025(Part 11)1983
2.	Temperature ^{0}C	29	30	29	29	IS 3025(Part 9)1984
3.	Turbidity (NTU)	1.8	2.0	1.8	2.1	IS 3025(Part 10)1984
CHEMICAL QUALITY						
1.	Total Suspended Solids (mg/l)	24	30.3	24.4	31.2	(APHA 23rd Ed.,2017,2540- D)
2.	Biochemical Oxygen Demand (BOD) (mg/l)	5.2	5.4	5.3	5.6	IS 3025(Part 44)1993Amd.01
3.	Sulphate as SO_4(mg/l)	2604	2821	2649	2680	(APHA 23rd Ed.,2017,4500- SO4 E)
4.	Ammonical Nitrogen(µmol/l)	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	(APHA 23rd Ed.,2017,4500- NH3 B)
5.	Salinity	36.6	36.9	35.4	36.1	By Calculation
6.	Dissolved Oxygen (mg/l)	5.5	5.0	5.7	5.2	IS 3025(Part 38)1989,
7.	Total Nitrogen (µmol/l)	3.7	3.4	3.6	3.4	(APHA 23rd Ed.,2017,4500-O,B),
8.	PO_4^3-P (µmol/l)	0.47	0.25	0.24	0.6	APHA 23rd Ed.,2017,4500 NH3 - B
9.	$(NO_3$-N)e (µmol/l)	0.6	0.9	1.2	1.5	(APHA 23rd Ed.,2017,4500-P,D)
10.	$(NO_2$-N) Nitrite (µmol/l)	BDL(MDL:0.1)	BDL(MDL:0.1)	0.1	0.6	(APHA 23rd Ed.,2017,4500 NO3-B)
11.	Phenol(µmol/l)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	APHA 23rd Ed.,2017,4500NO2B
12.	PHc (ppb)	N.D.	N.D.	N.D.	N.D.	IS 3025(Part 43)1992Amd.02

Note: MDL = Minimum Detection Limit (MDL: 0.01) and N.D. = Not detectable

Table 3 (Continued 3)

Sr. No.	Parameters	Station 5		Test Method Permissible
		Surface	Bottom	
PHYSICAL QUALITY				
1.	pH @ 25 ° C	8.16	8.10	IS 3025(Part 11)1983
2.	Temperature (^{0}C)	29.2	29	IS 3025(Part 9)1984
3.	Turbidity (NTU)	1.9	2.3	IS 3025(Part 10)1984
CHEMICAL QUALITY				
1.	Total Suspended Solids	24	30.2	(APHA 23rd Ed.,2017,2540-D)
2.	Biochemical Oxygen Demand (BOD) (mg/l)	5.9	5.7	IS 3025(Part 44)1993Amd.01
3.	Sulphate as SO_4 (mg/l)	2327	2678	(APHA 23rd Ed.,2017,4500-SO4 E)
4.	Ammonical Nitrogen(µmol/l)	BDL(MDL:2.0)	BDL(MDL:2.0)	(APHA 23rd Ed.,2017,4500-NH3 B)
5.	Salinity	35.2	36.1	By Calculation
6.	Dissolved Oxygen (mg/l)	5.3	4.9	IS 3025(Part 38)1989,
7.	Total Nitrogen (µmol/l)	1.3	1.6	(APHA 23rd Ed.,2017,4500-O,B),
8.	PO_4^3-P (µmol/l)	BDL(MDL:0.1)	0.52	APHA 23rd Ed.,2017,4500 NH3 - B
9.	(NO_3-N)e (µmol/l)	0.6	BDL(MDL:0.1)	(APHA 23rd Ed.,2017,4500-P,D)
10.	(NO_2-N) Nitrite (µmol/l)	0.6	0.6	(APHA 23rd Ed.,2017,4500 NO3-B)
11.	Phenol(µmol/l)	BDL(MDL:0.01)	BDL(MDL:0.01)	APHA 23rd Ed.,2017,4500NO2B
12.	PHc(ppb)1M Level	N.D.	N.D.	IS 3025(Part 43)1992Amd.02

Note: MDL = Minimum Detection Limit (MDL: 0.01) and N.D. = Not detectable

3.1.1 Temperature: Marine water temperature was checked on site during the sampling. Surface and bottom water temperatures observed in the study area were in a range between 29^{0}C to 30^{0}C. The water temperature generally varied in accordance with the prevailing air temperature, tidal activity, and seasonality.

3.1.2 pH: The pH of the water is generally buffering effect, influenced by the freshwater and anthropogenic discharge from land. The observed pH in the study area was in the range of 7.95 to 8.16 at the surface and 8.01 to 8.16 at bottom water.

3.1.3 Salinity: Salinity is an indicator of (saline or freshwater) water masses intrusion within the region. The standard average salinity of seawater is 35.2 to 37.3, which may vary with the riverine or inland influx, rains or evaporation in the region. The salinity variation during the present sampling was 35.2 to 36.6 at surface and 35.4 to 37.3 at bottom water.

3.1.4 DO and BOD: High DO level is an indication of good oxidizing conditions in an aquatic environment. In unpolluted waters equilibrium is maintained through oxygen production during photosynthesis, dissolution from the atmosphere consumption by the respiration and decay of organic matter in a manner that DO levels are close to or above saturation value.

The DO level of the study area was varied from 5.2 to 6.1 mg/l at the water surface and 5.0 to 5.6 mg/l at bottom water. The average DO value was 5.5 mg/l, which indicates the oxygenated conditions in the study region.

BOD is generally indicating effective consumption of oxidizable matter in that water body. The industrial effluents contain high BOD levels. Thus, high BOD is also an indication of the intrusion of industrial polluted effluent into natural waters. BOD levels in the study area were varied from 5.2 to 5.9 mg/l at surface and 5.4 to 5.7 mg/l at bottom water.

3.1.5 Nutrients: Dissolved phosphorus and nitrogen compounds serve as the nutrients for phytoplankton growth. The high nutrient concentrations in the seawater generally could be attributed to anthropogenic and industrial influx. This could lead to further eutrophication and further deterioration of the pristine ecosystem. Phosphorous compounds are present predominantly as reactive phosphate while combined nitrogen is present as nitrate, nitrite and ammonium species. In the present study, Phosphate concentration was range from 0.17 to 0.47µmol/l on the surface and 0.16 to 0.60µmol/l bottom water. Nitrate concentration was range from 0.6 to 1.5 µmol/l on the surface and bottom water. Nitrite concentration was range from 0.1 to 0.6 µmol/l on the station 4 & 5 and not detected in the Station 1, 2 & 3.

3.1.6 PHc and phenol: The Phenol compounds and PHc were not detected in the present investigation.

.**3.1.7 Total suspended solids (TSS)**: The suspended solids generally constitute silt and clay eroded from the land or shore erosions and suspension of the benthic layers from the seabed. Anthropogenic discharges also contribute to suspended solids in the form of contaminants such as oil and solid waste in a polluted area. On a seasonal basis, high TSS in seawater could be observed during the active monsoon season. Suspended solid concentration in the study

area was a little variable. In surface water, TSS was 24 to 24.4 mg/l and in the bottom water, it was range from 30 to 34.2 mg/l.

4 SEDIMENT QUALITY MONITORING

The sediment quality at different sampling stations was measured during this investigation. The results are presented in Tables 4 and 5.

Table 4: Subtidal sediment quality parameters and their test methods.

No.	Parameters	SUBTIDAL SEDIMENT QUALITY(µgm/gm)					Test Method Permissible
		Station 1	Station 2	Station 3	Station 4	Station 5	
1	Texture	Silty sand	Silty-sand	Silty-sand	Silty-clay	Silty-clay	--
2	Aluminium as Al%	N.D.	N.D.	N.D.	N.D.	N.D.	IS 3025(Part 55)2003
3	Cobalt as Co(µg/g)	17.01	16.93	13.01	12.05	12.23	AAS Method
4	Copper as Cu(µg/g)	14.40	15.8	13.77	11.03	9.60	IS 3025(Part 42)1992amd .01,
5	Zinc as Zn	22.9	22.07	27.75	25.09	25.55	IS 3025(Part 49)1994
6	Mercury(µg/g)	BDL(MDL :0.05)	BDL(MDL :0.05)	BDL(MDL :0.05)	BDL(MDL :0.05)	BDL(MDL :0.05)	(APHA 22ndEd.,2012 ,3112-B)
7	Phosphorous (Total)(µg/g)	291.4	286.4	242.4	241.1	220.2	(APHA22ndEd.,2012,4500-P,D)
8	C(Org.) %	N.D.	N.D.	N.D.	N.D.	N.D.	Standard method (Walkley and Black, 1934).
9	Chromium(µg/g)	9.47	6.37	13.92	9.21	13.32	IS 3025(Part 52)2003,
10	Nickel(µg/g)	14.62	15.53	18.55	16.03	10.78	IS 3025(Part 54)2003,
11	Manganese	309.5	239.8	124.1	207.5	190.9	APHA22ndEd. ,2012,3500 Mn B
12	Iron%	2.2	3.9	2.2	2.1	2.9	IS 3025(Part 53)2003,
13	PHc(µg/g)	N.D.	N.D.	N.D.	N.D.	N.D.	G.C. Method
14	Arsenic(µg/g)	BDL(MDL :0.05)	BDL(MDL :0.05)	BDL(MDL :0.05)	BDL(MDL :0.05)	BDL(MDL :0.05)	APHA22ndEd. 2012,3114-C

Note: MDL = Minimum Detection Limit (MDL: 0.01) and N.D. = Not detectable

Table 5: Intertidal sediment quality parameters and their test methods.

INTER TIDAL SEDIMENT QUALITY (µg/g)						
Sr. No	Parameters	Transect 1		Transect 2		Test Method Permissible
		High Tide	Low Tide	High Tide	Low Tide	
1.	Texture	Silty-sand	Silty-Sand	Silty-sand	Silty-sand	--
2.	Aluminium as Al%	N.D.	N.D.	N.D.	N.D.	IS 3025(Part 55)2003
3.	Cobalt as Co(µg/g)	6.12	6.16	5.71	7.05	AAS Method
4.	Copper as Cu(µg/g)	2.41	3.51	3.55	5.92	IS 3025(Part 42)1992amd.01,
5.	Zinc as Zn	10.04	8.06	6.48	12.27	IS 3025(Part 49)1994
6.	Mercury(µg/g)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	(APHA 22ndEd.,2012,3112-B)
7.	Phosphorous (Total)(µg/g)	292.6	272.1	224.5	212.7	(APHA 22ndEd.,2012,4500-P,D)
8.	C(Org.) %	N.D.	N.D.	N.D.	N.D.	Standard method (Walkley and Black, 1934).
9.	Chromium(µg/g)	5.21	4.62	3.08	6.09	IS 3025(Part 52)2003,
10.	Nickel(µg/g)	9.84	10.4	8.11	11.56	IS 3025(Part 54)2003,
11.	Manganese	124.8	112.3	86.4	176.4	APHA 22ndEd.,2012,3500 Mn B
12.	Iron%	2.2	2.5	2.2	2.8	IS 3025(Part 53)2003,
13.	PHc(µg/g)	N.D.	N.D.	N.D.	N.D.	G.C. Method
14.	Arsenic(µg/g)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	APHA 22ndEd.,2012,3114-C

Note: MDL = Minimum Detection Limit (MDL: 0.01) and N.D. = Not detectable

Table 5 Continued 2

Sr. No	Parameters	Transect 3		Test Method Permissible
		High Tide	Low Tide	
1.	Texture	Sandy	Sandy	--
2.	Aluminium as Al%	N.D.	N.D.	IS 3025(Part 55)2003
3.	Cobalt as Co(µg/g)	4.82	6.04	AAS Method
4.	Copper as Cu(µg/g)	2.84	12.42	IS 3025(Part42)1992amd. 01,
5.	Zinc as Zn	9.65	12.6	IS 3025(Part 49)1994
6.	Mercury(µg/g)	BDL(MDL:0.05)	BDL(MDL:0.05)	(APHA 22nd Ed.,2012,3112-B)
7.	Phosphorous (Total)(µg/g)	208.6	292.1	(APHA 22nd Ed.,2012,4500-P,D)
8.	C(Org.) %	N.D.	N.D.	Standard method (Walkley and Black,1934).
9.	Chromium(µg/g)	4.54	4.83	IS 3025(Part 52)2003,
10.	Nickel(µg/g)	7.86	17.04	IS 3025(Part 54)2003,
11.	Manganese	82.1	71.52	APHA 22nd Ed.,2012,3500 Mn B
12.	Iron%	2.3	2.0	IS 3025(Part 53)2003,
13.	PHc(µg/g)	N.D.	N.D.	G.C. Method
14.	Arsenic(µg/g)	BDL(MDL:0.05)	BDL(MDL:0.05)	APHA 22nd Ed.,2012,3114-C

Note: MDL = Minimum Detection Limit (MDL: 0.01) and N.D. = Not detectable

- The sediment in the subtidal region was mainly composed of sandy to clayey silt. In the intertidal region, sediment **texture** was sandy.
- In the subtidal stations, the highest **phosphorus** content (286.4 µgm/gm) was recorded at station 2 whereas the lowest was at station 5 (220.2 µgm/gm). In the intertidal region highest phosphorus content (292.6 µg/g) was recorded at IT-1 (HT) and lowest at (208.6 µg/g) IT-3 (HT). The higher phosphorous content at intake channel stations (1 and 2).
- The **Chromium** content of marine sediment was ranged from 6.37 to 13.92 µg/g. The highest chromium content was recorded at station 3 and the lowest at station 2. In the Intertidal region, the chromium content was ranged from 3.08 to 4.83 µg/g.

- The highest **Nickel** content (18.55 µg/g) was recorded at station 3 and lowest (9.21 µg/g) at station 1. In the intertidal region, highest Nickel content (17.04µg/g) was recorded at IT-3 (LTL) and lowest (7.86 µg/g) at IT-3 (HTL).
- At station 2, the highest **Copper** content (15.8 µg/g) was recorded, whereas the lowest was detected at station 5 (9.60 µg/g). In the intertidal region highest Copper content (12.42 µg/g) was recorded at IT-3 (LTL), whereas the lowest was detected at IT-1 (HTL) (2.41 µg/g).
- The **Zinc** content (27.75 µg/g) was highest at station 3 and the lowest zinc content (22.07 µg/g) at station 2. The zinc content in the intertidal region (12.6 µg/g) was highest at IT-3 (LTL) and the lowest zinc content (6.48 µg/g) at IT-2 (HTL).
- The **Organic carbon** was not detected.
- The **Iron** content was higher at station 2 (3.9%) and lower at station 4 (2.1%). In the Intertidal region, the highest iron content was recorded at IT-2 (LTL) (2.8%) and lowest at IT-3 (LTL) (2.0%).
- In the subtidal region, the highest **Manganese** content was recorded at station 1 (309.5µg/g), whereas the lowest was recorded at station 3 (124.1µg/g). In the intertidal region highest Manganese content was recorded at IT-2(LTL) (176.4µm/g). The lowest Manganese content (82.1µg/g) was found at IT-3(HTL).
- The **Aluminium** was not detected.
- The highest **Cobalt** content (17.93µg/g) was recorded at station 2 and lowest at station 4 (9.60µg/g). In the intertidal region, highest Cobalt content (7.05µg/g) was recorded at IT-2 (LTL) and lowest at IT-3 (HTL) (4.82µg/g).
- The **PHc**, **Arsenic** & **Mercury** was not detected in the sediments during this study.

5 BIOLOGICAL PARAMETERS (BIODIVERSITY STUDY)

The Marine environment is unique ecosystem that involve the complex interaction between abiotic and biotic components. Any change in the abiotic factors leads to change in aquatic organisms (biotic factor). Human interventions always compromise the health of the marine ecosystem by disturbing the ecological balance. Hence the assessment of the biotic components along with abiotic factors is an integral part of environmental assessment and

monitoring study. During the present study at APMuL, the abundance and distribution of marine organisms (plankton and benthos) were studied as part of routine environmental monitoring.

5.1 PLANKTONIC FORMS

The name plankton is derived from the Greek word “planktons”, meaning “wanderer” or “drifter”. While some forms of plankton are capable of independent movement and can swim up to several hundred meters in a single day, their position is primarily determined by currents in the body of water they inhabit. By definition, organisms classified as "plankton" are unable to resist ocean currents. Plankton is primarily divided into two broad functional groups i.e., Phytoplankton and Zooplankton.

5.1.1 Phytoplankton

The organisms responsible for primary production in all aquatic ecosystems are known as “phytoplankton.” These miraculous microscopic organisms not only form the base of life in our oceans but also produce up to 90% of the oxygen in our atmosphere.

Phytoplankton are microscopic plants that live in the ocean, freshwater, and other terrestrial-based water systems. There are many species of phytoplankton, each of which has a characteristic shape, size, and function. Marine species of phytoplankton grow abundantly in oceans around the world and are the foundation of the marine food chain. Marine phytoplankton are the producing (autotrophic) component in the ocean. There are fourteen classes of phytoplankton. Each class of phytoplankton contains unique attributes in size, cell structure, nutrients, and function.

5.1.2 Zooplankton:

Zooplankton are the consumer organisms, incapable of making their food from light or inorganic compounds, and feed on organisms or the remains of other organisms to get the energy necessary for survival. They are primarily depending on the phytoplankton and other small organisms’ groups for their nutritional needs.

5.2 SIGNIFICANCE OF PHYTO- AND ZOOPLANKTONS

Phytoplankton are the major primary producers of organic matter in the aquatic ecosystem. They contribute up to 90% in primary productivity in the Oceanic environment. As part of the photosynthesis process, they produce organic compounds from carbon dioxide

with the help of sunlight and inorganic compound. Collectively, they directly or indirectly support the entire animal population and thus form the basis of most marine food webs. Phytoplankton also helps in the carbon dioxide sequestration process. The significance of zooplanktons is found in their role in transferring biological production from phytoplankton to large organisms in the marine food web and the seafloor. The microscopic protozoan, tunicates, copepods and other crustaceans graze upon a large number of phytoplankton species. These in turn become food for other animals further linking the food web. Therefore, variability in reproduction of copepods would affect the survival of young fish that depend on them.

Table 6: Test methods for phytoplankton and zooplankton analysis

Sr. no.	Test performed	Method
1	Phytoplankton	APHA, Edition 23, Part 10000, 10200 F
2	Chlorophyll *a* and Pheophytin	APHA, Edition 23, Part 10000, 10200 H (with some modification)
3	Zooplankton	APHA, Edition 23, Part 10000, 10200 G
4	Macro benthos	APHA, Edition 23, Part 10000,10500 A-10500 D

5.3 PHYTOPLANKTON DIVERSITY:

Phytoplankton sampling was carried out at 5 stations. At each station, water samples were collected from surface and bottom waters. The sampling location is given in the following table.7

During the sampling period (March 2022) the phytoplankton population in the coastal waters of APMuL, Mundra was diverse and represented with a total of 32 phytoplankton genera belonging to diatoms (31 genera) and dinoflagellates (1 genera). The diatoms species belonging to genus *Amphidinium, Amphora, Bacteriastrum, Bacillaria, Cerataulina, Chaetoceros, Corethron, Coscinodiscus, Cylindrotheca, Diploneis, Ditylum, Fragilaria, Gunardia, Haslea, Hemialus, Lauderia, Leptocylindrus, Melocera, Meuneria, Navicula, Nitzschia, Odontella, Pleurosigma, Planktoniella, Pseudonitzschia, Rhizosolenia, Skeletonema, Surirella, Thalassionema and Thalassiosira* dominated phytoplankton assemblage in the

study region. Among them, species belonging to the genus *Coscinodiscus* (16.5%), *Thalassiosira* (13.6%) and *Skeletonema* (10.8%) were predominant. The predominance of *Coscinodiscus* (96 cells×10^{-2} L^{-1}) was observed at Station 3 surface water, whereas *Thalassionema* (66 cells×10^{-2} L^{-1}) dominated phytoplankton assemblage at Station 5 bottom water. Dinoflagellate population in the region was represented by only *Ceratium* species with low abundance (0.3%).

The phytoplankton abundance in the study region was ranged from 630 to 1014 cells×10^{-2} L^{-1}. The highest phytoplankton abundance was observed at Station 3 in surface (1014 cells×10^{-2} L^{-1}) and then at Station 2 in bottom water (876 cells×10^{-2} L^{-1}) waters. The lowest phytoplankton abundance (630 cells×10^{-2} L^{-1}) was observed at Station 4 in surface water (Table 7; Figure 2). The study shows that the marine water around APMuL enriched with the diverse phytoplankton population.

Table 7: Phytoplankton abundance (cells×10^{-2} L^{-1}) at different sampling stations in the coastal waters of APMuL, Mundra during March 2022.

Note: S=surface; B=bottom; St=station

Phytoplankton genera	Sampling stations									
	St-1	St-1	St-2	St-2	St-3	St-3	St-4	St-4	St-5	St-5
	S	B	S	B	S	B	S	B	S	B
Diatoms										
Amphidinium	3	0	0	0	6	6	0	0	0	0
Amphora	3	6	12	0	15	6	0	0	3	0
Bacteriastrum	0	0	0	0	0	0	0	0	9	0
Bacillaria	0	3	9	6	0	6	0	9	0	0
Cerataulina	0	0	6	0	3	30	0	0	0	0
Chaetoceros	12	6	24	24	36	45	0	36	36	18
Corethron	3	3	0	36	0	6	0	3	6	0
Coscinodiscus	60	66	54	54	96	60	60	48	54	36
Cylindrotheca	9	6	15	24	15	0	0	3	0	3
Diploneis	9	6	0	6	0	0	0	0	0	0
Ditylum	6	3	6	15	36	24	36	21	15	45
Fragilaria	30	36	15	24	21	9	9	18	0	6
Gunardia	0	0	0	6	30	24	3	0	0	0
Haslea	6	6	0	0	0	0	0	9	3	0
Hemialus	0	0	6	12	0	6	18	0	0	0
Lauderia	15	0	0	0	24	0	27	6	6	15
Leptocylindrus	3	6	6	0	0	0	0	0	0	12
Mastoglea	3	0	0	0	0	0	0	12	9	0

Melocera	3	6	0	0	18	48	21	6	6	0
Meuneria	0	0	3	9	0	0	0	6	9	0
Navicula	45	36	27	12	18	9	9	15	3	21
Nitzschia	0	3	0	0	15	0	0	0	12	0
Odontella	6	6	9	36	63	36	30	24	30	54
Pleurosigma	15	6	3	39	15	6	0	9	6	6
Planktoniella	0	0	0	0	0	0	0	9	3	3
Pseudonitzschia	0	0	0	0	12	0	0	0	6	0
Rhizosolenia	12	0	0	6	6	6	6	9	9	18
Skeletonema	36	33	48	36	12	18	36	75	63	30
Surirella	6	15	0	0	9	3	3	15	3	3
Thalassionema	24	18	36	36	21	6	24	6	15	24
Thalassiosira	45	63	54	57	36	54	30	27	33	87
Dinoflagellates										
Ceratium	0	0	3	0	0	0	3	0	6	0
Total phytoplankton (cells×10^{-2} L^{-1})	**708**	**666**	**672**	**876**	**1014**	**816**	**630**	**732**	**690**	**762**

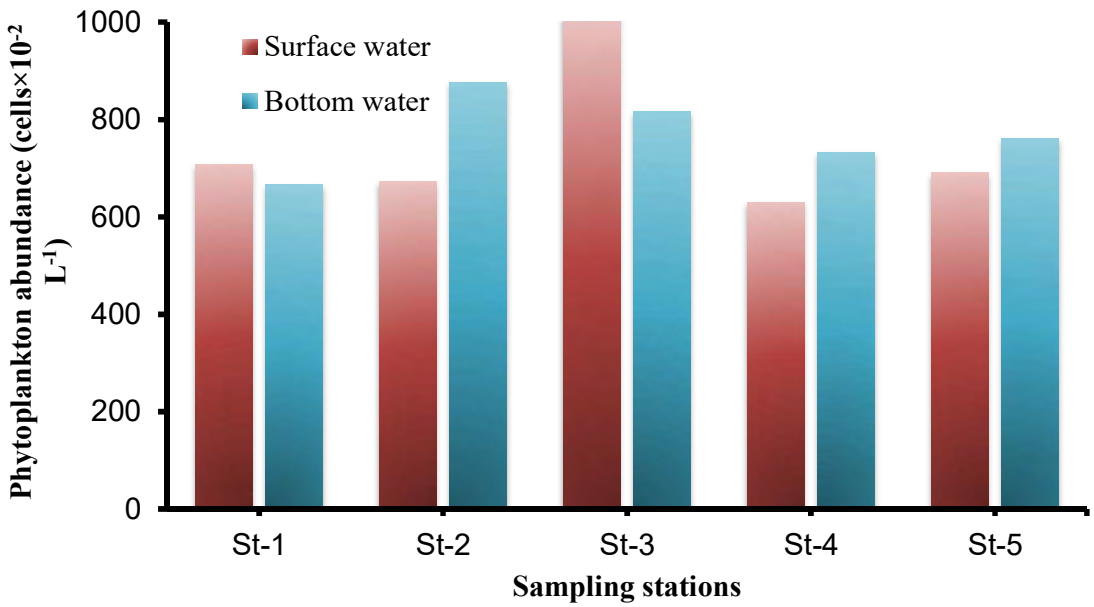

Figure 2: Phytoplankton abundance (cells×10^{-2} L^{-1}) reported in the surface and bottom waters along the APMuL coast, Mundra during March 2022.

Note: ST=Station

***Coscinodiscus* sp.**

***Odontella* sp.**

***Chaetoceros* sp.**

***Chaetoceros* sp.**

Figure 3: Microphotographs of phytoplankton reported in the coastal waters of APMuL, Mundra during March 2022.

5.4 PHYTOPLANKTON PIGMENTS (CHLOROPHYLL *a* AND PHEOPHYTIN):

Marine phytoplankton contains the essential as well as accessory pigment similar to that of terrestrial plants. Chlorophyll is the essential photosynthetic, green molecule responsible for energy fixation in the process of photosynthesis. The energy fixed by the phytoplankton gets transferred to higher tropic levels in the food web through the grazing process by the consumers. Chlorophyll is a measure of algal biomass and it acts as an empirical link between nutrient concentrations.

Algal chlorophyll forms a series of degradation products upon degradation. In addition to Chlorophyll the naturally occurring pigments in algal cells, a filtered water sample will also contain coloured degradation products of these pigments. The nature of these degradation products depends on which part of the chlorophyll molecule is affected. As chlorophyll

degrades, the initial step is either the loss of the magnesium from the centre of the molecule or the loss of the phytol tail. This results in the formation of the molecule, *phaeophytin*. Depending on the parent molecule several distinct molecules like phaeophytins, chlorophyllides, and pheophorbides can be produced. Thus, in addition to Chlorophyll *a* filtered seawater contains colour degradation products of phytoplankton pigments.

5.4a CHLOROPHYLL *a* AND PHAEOPHYTIN CONCENTRATIONS

The phytoplankton biomass distribution expressed in terms of Chlorophyll a (Chl*a*) and Pheophytin at selected stations in the coastal region of APMuL, Mundra is presented in Table 8. The Chl*a* concentrations in the study region were ranged from 0.82 to 1.80 µg. L^{-1}. The Pheophytin content was ranged from 0.43 to 0.96 µg. L^{-1}. The Chl*a* and Pheophytin concentrations were more in the bottom water as compared to the surface water, except Station 1. The variations observed between the surface and bottom waters could be due to several natural biological variability. The highest Chl*a* and Pheophytin concentrations were observed at Station 3 (Table 8).

Table 8: Chlorophyll *a*, Pheophytin concentrations along with their ratios (Chl*a*: Pheophytin) in the marine waters of APMuL, Mundra during March 2022.

Note: ST= Station

Sampling stations		Chlorophyll a (µg. L^{-1})	Phaeophtin (µg. L^{-1})	Chl*a*:Phaeophtin ratio
St-1	**Surface**	0.90	0.52	1.73
St-1	**Bottom**	0.82	0.43	1.91
St-2	**Surface**	0.87	0.66	1.31
St-2	**Bottom**	1.02	0.91	1.12
St-3	**Surface**	1.80	0.92	1.96
St-3	**Bottom**	1.76	0.96	1.83
St-4	**Surface**	0.91	0.49	1.86
St-4	**Bottom**	0.94	0.82	1.15
St-5	**Surface**	0.87	0.48	1.81
St-5	**Bottom**	1.20	0.62	1.94

The concentration of Pheophytin is a measure of the dead cells and is an indirect indicator of biotic and abiotic stress conditions of the algae leading to a deterioration of Chl*a*. The ratio from concentrations of Chl*a* and Pheophytin in an aquatic ecosystem suggests a balance between the growth and mortality of phytoplankton life. In healthy environments, ratios of

Chl*a* to Pheophytin generally exceed 1.1. In the present study, this ratio was ranged from 1.12 to 1.96 (Table 8). The Chl*a* and Pheophytin ratio showed marginally elevated levels in the surface waters as compared to the bottom waters. Overall, the ratios of Chl*a* and Pheophytin concentration in the study region were generally high (>1), indicating that the appropriate conditions prevailed for the phytoplankton growth.

5.5 ZOOPLANKTON DIVERSITY:

Zooplankton standing stock in terms of abundance and species composition revealed substantial spatial variation within all 5 stations (Table 9). The maximum zooplankton abundance (873 no. m^{-3}) and biomass (0.13 ml m^{-3}) were recorded at Station 5. The lowest zooplankton abundance (687 no. m^{-3}) and biomass (0.09 ml m^{-3}) observed at Station 1 (Figure 4).

A total of 10 groups of zooplankton including Copepods, Copepod nauplii, Oikopleura, Decapod, Fish and decapode egg, Crustacean larvae, polychaete larvae, Gastropod larvae, Bivolve larvae and Fish larvae were identified during this study (Table 9). Among these groups Copepods (31 to 49 %) and Copepod nauplii (24 to 42%) were most dominant. Decapod larvae were also dominant group (4 to 30%) in zooplankton population. Gastropod, polychaete larvae as well as fish eggs also were another observed as minor group the present study. The occurrence of copepods and their nauplii together with decapods and fish larvae/eggs in zooplankton samples highlights the fair production potential of live food resources (organisms) to support the fish and crustacean population in the study region.

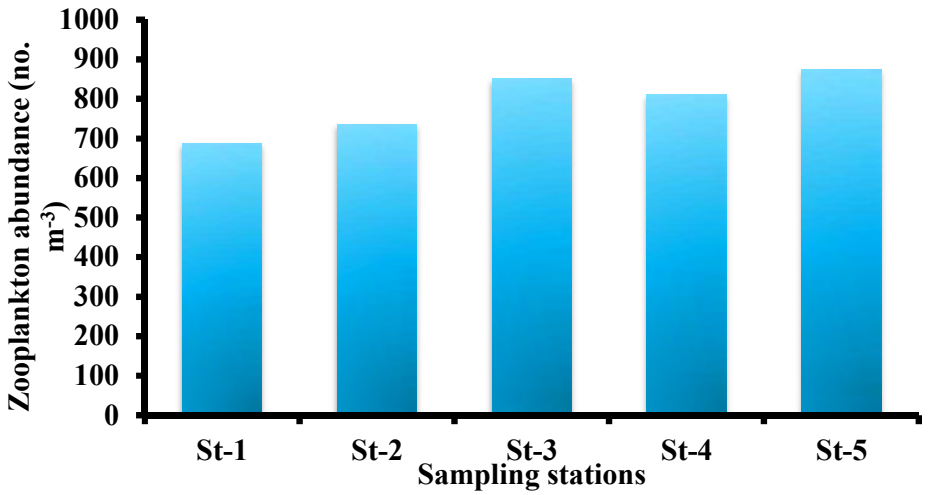

Figure 4: Zooplankton density (nos. / m^3) reported in the subtidal waters (Station 1 to 5) along the APMuL coast, Mundra during March 2022.

Table 9: Density (no. m^{-3}), percentage contribution (%) and biomass (ml. m^{-3}) of various zooplankton groups in the coastal waters at the APMuL, Mundra during March 2022.

Note: The values in the bracket indicates the percentage contribution of a particular group.
ST=Station

Zooplankton groups	Sampling stations				
	St-1	St-2	St-3	St-4	St-5
Copepoda	309	306	261	394	352
Copepod nauplii	196	176	243	311	371
Oikopleura	3	9	7	3	12
Decapoda	160	194	254	43	33
Fish and decapode egg	0	4	3	6	13
Crustacean larvae	3	4	27	28	33
Polychaete larvae	10	0	21	15	12
Gastrapod larvae	0	7	2	6	15
Bivolve larvae	7	14	23	3	33
Fish larvae	0	22	9	3	1
Total abundance (no m^{-3})	**687**	**736**	**851**	**810**	**873**
Biomass (ml. m^{-3})	**0.09**	**0.10**	**0.12**	**0.12**	**0.13**

Fish larvae

Copepod

Copepod nauplii

Copepod

Figure 5: Microphotographs of zooplanktons reported in the coastal waters of APMuL, Mundra during March 2022.

5.6 MACROBENTHIC FAUNA

The benthic zone is the ecological region at the lowest level of water (such as an ocean or a lake) which include the sediment surface and some sub-surface layers. The superficial layer of sediment is an integral part of the benthic zone, as it influences greatly the biological activity, which takes place there. Organisms living in this zone are called benthos. They generally live in a close relationship with the substrate bottom; many such organisms are attached to the bottom. Some benthic organisms are mainly dwelling at the bottom of the substratum but at times may travel upwards in the water column. They may also occupy rock crevices, organic debris, and another microhabitat at the bottom. The benthic invertebrates range from microscopic (e.g., micro invertebrates, <10 microns) to a few centimetres or more in length (e.g., macroinvertebrates).

Benthic organisms are morphologically different from that planktonic organisms. Many are adapted to live on the substrate (bottom). In benthic habitats, they can be considered dominant creatures. These organisms adapted to deep-water pressure so cannot survive in the upper parts of the water column. Since light does not penetrate very deep ocean water, the benthic organisms often depend on the organic matter falling from the upper water column as their main energy source. This dead and decaying matter sustains the benthic food chain. The most benthic organisms are scavengers or detritivores. These organisms under being relatively stationary, are constantly exposed to changes undergoing in overlying water, and hence, respond very well to aquatic pollution. The macro benthos population is very sensitive to environmental perturbation and is highly influenced by the physicochemical characteristics of water, the nature of the substratum, food, predation, and other factors. The density of benthic invertebrates also fluctuates widely with the changes in the season.

5.6.1 Significance of macrobenthic organisms

The biomass of microbenthic organisms in estuaries and coastal embayment is often high. It declines if communities are affected by prolonged periods of poor water quality especially when anoxia and hypoxia are common. Burrowing and tube-building by deposit-feeding benthic organisms (bioturbations) help to mix the sediment and enhance the decomposition of organic matter. Nitrification and denitrification are also enhanced because a range of oxygenated and anoxic micro-habitats are created. For example, the area of oxic-anoxic

boundaries and the surface area available for diffusive exchange are increased by tube-building macrobenthos.

The loss of benthic suspension-feeders can further enhance turbidity levels because these organisms filter suspended particles including planktonic algae, and they enhance sedimentation rates through bio deposition (*i.e.,* voiding of their wastes and unwanted food). Changes in the macro fauna (and flora) cause changes in nutrient storage pools. Macro fauna is also important constituents of fish diets and thus are an important link for transferring energy and nutrients between trophic levels, also driving pelagic fish and crustacean production. For these reasons, the benthic organisms are extremely important indicators of environmental change.

5.6.2 Benthic Diversity

5.6.2a Subtidal region:

The sediment texture at the sampling stations ranged from sandy-silty to silty sediment (Table 1 and 4), which directly affects the distribution of the benthic organisms in this region. The fluctuation in tidal level and exposer time also influences the occurrence of benthic organisms in the intertidal transects.

During the present study, high macrobenthos abundance and biomass was reported at subtidal stations than intertidal stations at APMuL, Mundra (Table 10). The macrobenthos density was ranged from 500 no. m^{-2} to 800 no. m^{-2} at sampling stations (Table 10; Figure 6). The biomass of the macrobenthic community in the study region was ranged from 0.90 g. m^{-2} to 1.25 g. m^{-2} in the study region. The maximum density and biomass of benthic macro-organisms were reported at Station 4 (800 no. m^{-2} and 1.25 g. m^{-2} respectively). Similarly, the least density (500 no. m^{-2}) and biomass (0.90 g. m^{-2}) was observed at Station 1 (Table 10; Figure 6).

In species composition, Polychaete species (Phylum Annelida) belonging to the family Paraonidae, Orbiniidae, Cossuridae, Eunicidae, Nereidae, Spionidae, Syllidae, Nephtyidae contributed (67%) to the macrobenthic abundance especially at Station 4 and Station 5. Overall, the presence of Polychaete, Sipuncula worms and amphipods suggest the availability of food organisms for benthic predators in the area.

Table 10: Faunal composition, density (no. m^{-2}) and biomass (g. m^{-2}) of the macrobenthos community in the subtidal region at APMuL, Mundra during March 2022.
Note: ST=Station

Faunal groups	Subtidal stations				
	St-1	St-2	St-3	St-4	St-5
Phylum Annelida					
Paraonidae	150	250	150	400	350
Orbiniidae	25	0	0	25	0
Cossuridae	0	25	0	25	25
Eunicidae	0	0	25	0	0
Nereidae	50	0	50	50	50
Capitellidae	0	0		0	0
Spionidae	75	25	0	75	0
Sabellidae	0	25	0	0	0
Syllidae	0	0	0	50	0
Nephtyidae	0	0	50	0	150
Phylum Protozoa					
Foraminifera	25	0	0	25	25
Phylum Mollusca					
Bivalve	0	0	0	25	25
Phylum Arthropoda					
Amphipoda	25	100	100	25	0
Isopoda	0	0	0	0	25
Phylum Sipuncula					
Sipunculids	150	125	150	100	100
Total density (no. m^{-2})	**500**	**550**	**525**	**800**	**750**
Biomass (g. m^{-2})	**0.90**	**0.95**	**0.81**	**1.25**	**1.05**

5.6.2b Intertidal region

The sandy substratum with low organic matter affects the occurrence of the macrobenthic community in the intertidal region. Low macrobenthos biomass was measured (0.02 g. m^{-2} to 0.09 g. m^{-2}) in the intertidal region at the APMuL marine monitoring area (Table 11). The lowest density of macrobenthic organisms was reported at station IT-2 (HW) (50 no. m^{-2}), whereas, the highest density was reported at Station IT-1 (LW) (125 nos. m^{-2}). Polychaete species contributed (57%) to the total macrobenthic abundance at these stations followed by Amphipoda (38%) (Table 11). No macrobenthic community was observed at Sstation 3 (HW and LW) may be due to sandy sediment.

Table 11: Faunal composition, density (nos. m^{-2}) of macrobenthos from the sediments collected at High Tide Levels (HTL) and Low Tide Levels (LTL) in the inter-tidal region at APMUL, Mundra during March 2022.

Note: LW=low water during low tide; HW=high water during high tide
ST=Station

Faunal groups	Subtidal stations				
	St-1	St-2	St-3	St-4	St-5
Phylum Annelida					
Paraonidae	150	250	150	400	350
Orbiniidae	25	0	0	25	0
Cossuridae	0	25	0	25	25
Eunicidae	0	0	25	0	0
Nereidae	50	0	50	50	50
Capitellidae	0	0		0	0
Spionidae	75	25	0	75	0
Sabellidae	0	25	0	0	0
Syllidae	0	0	0	50	0
Nephtyidae	0	0	50	0	150
Phylum Protozoa					
Foraminifera	25	0	0	25	25
Phylum Mollusca					
Bivalve	0	0	0	25	25
Phylum Arthropoda					
Amphipoda	25	100	100	25	0
Isopoda	0	0	0	0	25
Phylum Sipuncula					
Sipunculids	150	125	150	100	100
Total density (no. m^{-2})	**500**	**550**	**525**	**800**	**750**
Biomass (g. m^{-2})	**0.90**	**0.95**	**0.81**	**1.25**	**1.05**

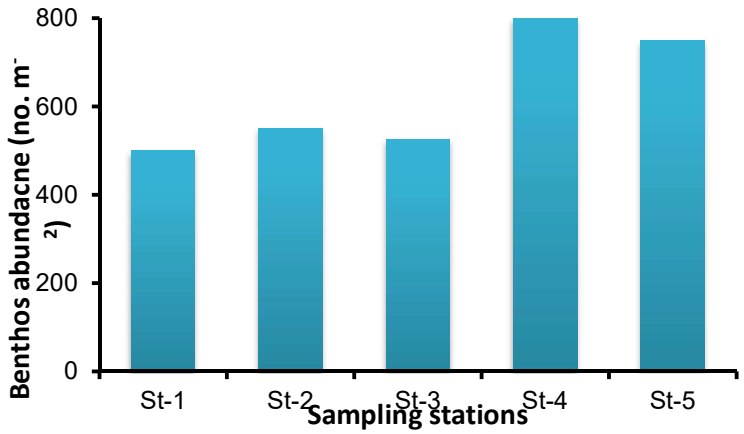

Figure 6: Subtidal macro benthos abundance (no. m^{-2}) at different sampling stations at APMuL, Mundra during March 2022

Polychaetes

Polychates

Polychaetes

Amphipod

Figure 7: Microphotographs of microbenthic organisms observed in the sediment samples collected in the vicinity of APMuL, Mundra during March 2022.

6 CONCLUSION

- The phytoplankton abundance in the study region was ranged from 630 to 1014 cells 10^{-2} L^{-1}. Highest phytoplankton abundance was observed at the Station 3 surface water. In general, the highest chlorophyll a (1.8 µg. L^{-1}) and pheophytin (0.96 µg. L^{-1}) content was recorded at Station 3. A maximum 33 phytoplankton genera were identified from water samples collected in this region. The diverse phytoplankton population supported by the environmental cues emphasises healthy ecosystem.
- Zooplankton abundance was ranged in between 687 to 873 no.m^{-3}. The highest zooplankton abundance (873 no. m^{-3}) and biomass (0.13 ml m^{-3}) was reported at Station 5.
- In the sub-tidal region macro benthos abundance (800 no. m^{-2}) and biomass (1.25mg. m^{-2}) was higher at ST-5. The lowest abundance (500 no. m^{-2}) and biomass (0.90 mg.

m^{-2}) was recorded at ST-1. The more abundance of macrobenthic community suggests the stable and enriched substratum supports their growth. In turn benthic macrofauna could support the benthic feeder fish population in this region.

The present assessment reveals the influence of the environmental cues on the physicochemical and biological parameters along the study region. The diverse phytoplankton and zooplankton population indicates favourable water condition for their survival and growth along the region. This diverse planktonic flora together with enriched subtidal benthic fauna along the outfall channel region could substantially support the fishery population in the region. These observations are in line with our present bioassay study where 90% survival of fish *Mugil cephalus* recorded in absolute outfall water as per compliance. For bioassay study, these fishes were collected from the Kotadi Creek. 90% survival of fish population in bioassay study together with the diverse biota at outfall channel from the present study emphasises that the abiotic characteristics does not have adverse biological impact of discharge water.

Table 12: Names of the Marine Monitoring Team Members

Sr. No.	Name of Person
1.	Mr. Vijay Thanki (Env. Chemist)
2.	Mr. Pravin Singh (Env. Chemist)
3.	Ms. Shweta A. Rana (Env. Microbiologist)
4.	Mr. Bhavin Patel (Env. Engineer)

PHOTOGRAPHS OF DIFFERENT TYPES OF SAMPLING

****

Adani Power (Mundra) Limited, Mundra

Summary of Continues Ambient Air Quality Monitoring System Reports (Oct'2021 TO Mar'2022)

		Station: ECO Park				Station: Near Main Gate				Station: Near Ash Pond			
Parameters		PM10	PM2.5	SO_2	NO_2	PM10	PM2.5	SO_2	NO_2	PM10	PM2.5	SO_2	NO_2
UNIT		ug/m^3	ug/m^3	ug/m^3	ug/m^3	ug/m^3	ug/m^3	ug/m^3	ug/m^3	ug/m^3	ug/m^3	ug/m^3	ug/m^3
MONTH	GPCB LIMIT	100	60	80	80	100	60	80	80	100	60	80	80
Apr'21	Minimum	48.7	17.5	13.9	13.2	50.9	20.7	14.8	15.8	48.1	20.6	16.4	18.0
	Maximum	64.5	23.7	20.3	28.1	63.6	26.0	20.2	23.8	61.1	33.3	22.8	25.4
	Average	56.9	20.6	17.4	20.3	56.4	23.3	17.6	19.8	56.2	25.9	19.3	21.8
May'21	Minimum	44.2	21.2	14.3	13.7	48.8	19.8	15.5	16.6	52.6	21.8	18.3	20.4
	Maximum	60.7	27.4	20.7	27.0	61.5	25.1	20.9	24.6	64.2	34.5	24.7	27.8
	Average	53.0	24.4	17.7	20.7	54.3	22.5	18.3	20.6	59.5	27.0	21.2	24.1
Jun'21	Minimum	47.2	22.9	14.2	21.3	47.4	19.4	16.2	19.8	53.4	22.5	19.4	21.4
	Maximum	60.2	27.1	20.4	27.4	61.3	26.7	24.2	26.3	65.6	31.2	26.1	28.4
	Average	53.5	24.9	16.4	24.4	55.0	23.5	20.1	23.1	60.2	26.1	22.3	24.8
Jul'21	Minimum	47.8	22.4	15.2	20.4	44.9	20.4	16.8	20.5	50.4	20.8	17.2	19.4
	Maximum	60.4	26.0	21.4	28.8	59.7	26.3	23.5	26.1	63.4	29.2	24.1	27.1
	Average	54.4	23.9	18.1	24.6	53.6	23.6	19.9	23.0	57.7	24.7	21.6	23.6
Aug'21	Minimum	50.8	16.9	10.6	18.3	44.7	15.8	11.2	18.4	44.6	18.5	10.7	17.0
	Maximum	66.8	30.1	22.8	27.4	60.4	29.1	25.2	32.1	69.4	27.9	21.3	27.2
	Average	57.9	23.7	16.9	23.8	53.4	22.6	16.7	23.7	57.7	23.7	16.0	23.1
Sep'21	Minimum	48.1	17.4	11.9	19.4	46.8	18.0	12.4	19.8	54.3	19.5	14.5	21.6
	Maximum	64.1	30.1	24.2	29.1	63.7	31.3	26.4	33.5	72.3	28.3	19.3	26.3
	Average	54.5	23.9	18.5	25.1	55.8	25.0	17.9	25.2	62.4	24.8	16.6	24.3

adani	Adani Power (Mundra) Limited, Mundra
	Differential Water Temperature Report (October'21 to March'22)

Annexure-V

Month: October'2021			
Date	**Intake Reservoir (°C)**	**Outfall channel (°C)**	**Temp. difference (°C)**
01/10/2021	30.0	OUM	OUM
02/10/2021	31.0	OUM	OUM
03/10/2021	31.5	OUM	OUM
04/10/2021	31.0	OUM	OUM
05/10/2021	31.5	OUM	OUM
06/10/2021	32.0	OUM	OUM
07/10/2021	29.0	OUM	OUM
08/10/2021	29.5	OUM	OUM
09/10/2021	30.0	OUM	OUM
10/10/2021	31.0	OUM	OUM
11/10/2021	32.0	OUM	OUM
12/10/2021	32.0	OUM	OUM
13/10/2021	31.0	OUM	OUM
14/10/2021	31.0	OUM	OUM
15/10/2021	31.5	OUM	OUM
16/10/2021	33.0	OUM	OUM
17/10/2021	31.5	OUM	OUM
18/10/2021	30.0	OUM	OUM
19/10/2021	32.0	OUM	OUM
20/10/2021	32.0	OUM	OUM
21/10/2021	31.5	OUM	OUM
22/10/2021	31.0	OUM	OUM
23/10/2021	31.5	OUM	OUM
24/10/2021	31.0	OUM	OUM
25/10/2021	30.5	OUM	OUM
26/10/2021	30.0	OUM	OUM
27/10/2021	30.5	OUM	OUM
28/10/2021	31.0	OUM	OUM
29/10/2021	30.5	OUM	OUM
30/10/2021	30.0	OUM	OUM
31/10/2021	30.5	OUM	OUM
Min.	**28.0**	OUM	OUM
Max.	**33.0**	OUM	OUM
Average	**31.0**	OUM	OUM

Note: OUM=Outfall Channel Under Maintenance

adani	**Adani Power (Mundra) Limited, Mundra**
	Differential Water Temperature Report (October'21 to March'22)

Month: November'2021			
Date	**Intake Reservoir (ºC)**	**Outfall channel (ºC)**	**Temp. difference (ºC)**
01/11/2021	30.5	OUM	OUM
02/11/2021	30.5	OUM	OUM
03/11/2021	31.0	OUM	OUM
04/11/2021	31.0	OUM	OUM
05/11/2021	30.5	OUM	OUM
06/11/2021	30.0	OUM	OUM
07/11/2021	30.5	OUM	OUM
08/11/2021	30.5	OUM	OUM
09/11/2021	31.0	OUM	OUM
10/11/2021	30.5	OUM	OUM
11/11/2021	29.5	OUM	OUM
12/11/2021	29.0	OUM	OUM
13/11/2021	30.0	OUM	OUM
14/11/2021	30.5	OUM	OUM
15/11/2021	31.0	OUM	OUM
16/11/2021	30.5	OUM	OUM
17/11/2021	30.5	OUM	OUM
18/11/2021	29.0	OUM	OUM
19/11/2021	28.5	OUM	OUM
20/11/2021	28.0	OUM	OUM
21/11/2021	28.0	OUM	OUM
22/11/2021	28.5	OUM	OUM
23/11/2021	28.0	OUM	OUM
24/11/2021	28.0	OUM	OUM
25/11/2021	29.0	OUM	OUM
26/11/2021	30.0	OUM	OUM
27/11/2021	29.0	OUM	OUM
28/11/2021	29.0	OUM	OUM
29/11/2021	30.0	OUM	OUM
30/11/2021	29.0	OUM	OUM
Min.	**28.0**	OUM	OUM
Max.	**31.0**	OUM	OUM
Average	**29.7**	OUM	OUM

Note: OUM=Outfall Channel Under Maintenance

adani	Adani Power (Mundra) Limited, Mundra
	Differential Water Temperature Report (October'21 to March'22)

Month: December'2021			
Date	**Intake Reservoir (ºC)**	**Outfall channel (ºC)**	**Temp. difference (ºC)**
01/12/2021	28.5	OUM	OUM
02/12/2021	29.0	OUM	OUM
03/12/2021	29.0	OUM	OUM
04/12/2021	28.5	OUM	OUM
05/12/2021	28.0	OUM	OUM
06/12/2021	29.0	OUM	OUM
07/12/2021	28.5	OUM	OUM
08/12/2021	28.0	OUM	OUM
09/12/2021	27.5	OUM	OUM
10/12/2021	27.0	OUM	OUM
11/12/2021	27.0	OUM	OUM
12/12/2021	27.5	OUM	OUM
13/12/2021	27.0	OUM	OUM
14/12/2021	26.5	OUM	OUM
15/12/2021	27.0	OUM	OUM
16/12/2021	27.0	OUM	OUM
17/12/2021	27.5	OUM	OUM
18/12/2021	27.0	OUM	OUM
19/12/2021	26.5	OUM	OUM
20/12/2021	26.0	OUM	OUM
21/12/2021	26.5	OUM	OUM
22/12/2021	27.0	OUM	OUM
23/12/2021	27.0	OUM	OUM
24/12/2021	27.5	OUM	OUM
25/12/2021	27.0	OUM	OUM
26/12/2021	28.0	OUM	OUM
27/12/2021	27.5	OUM	OUM
28/12/2021	27.0	OUM	OUM
29/12/2021	27.0	OUM	OUM
30/12/2021	27.5	OUM	OUM
31/12/2021	27.0	OUM	OUM
Min.	**26.0**	OUM	OUM
Max.	**29.0**	OUM	OUM
Average	**27.5**	OUM	OUM

Note: OUM=Outfall Channel Under Maintenance

adani	Adani Power (Mundra) Limited, Mundra
	Differential Water Temperature Report (October'21 to March'22)

Month: January'2022			
Date	**Intake Reservoir (ºC)**	**Outfall channel (ºC)**	**Temp. difference (ºC)**
01/01/2022	27.0	OUM	OUM
02/01/2022	27.5	OUM	OUM
03/01/2022	27.0	OUM	OUM
04/01/2022	27.0	OUM	OUM
05/01/2022	26.5	OUM	OUM
06/01/2022	26.0	OUM	OUM
07/01/2022	26.0	OUM	OUM
08/01/2022	26.5	OUM	OUM
09/01/2022	27.0	OUM	OUM
10/01/2022	27.5	OUM	OUM
11/01/2022	27.0	OUM	OUM
12/01/2022	26.5	OUM	OUM
13/01/2022	27.0	OUM	OUM
14/01/2022	26.5	OUM	OUM
15/01/2022	26.0	OUM	OUM
16/01/2022	26.0	OUM	OUM
17/01/2022	26.0	OUM	OUM
18/01/2022	26.5	OUM	OUM
19/01/2022	26.0	OUM	OUM
20/01/2022	26.5	OUM	OUM
21/01/2022	27.0	OUM	OUM
22/01/2022	27.5	OUM	OUM
23/01/2022	26.5	OUM	OUM
24/01/2022	26.5	OUM	OUM
25/01/2022	26.0	OUM	OUM
26/01/2022	26.5	OUM	OUM
27/01/2022	26.0	OUM	OUM
28/01/2022	26.5	OUM	OUM
29/01/2022	26.0	OUM	OUM
30/01/2022	26.0	OUM	OUM
31/01/2022	26.0	OUM	OUM
Min.	**26.0**	OUM	OUM
Max.	**27.5**	OUM	OUM
Average	**26.5**	OUM	OUM

Note: OUM=Outfall Channel Under Maintenance

adani	Adani Power (Mundra) Limited, Mundra
	Differential Water Temperature Report (October'21 to March'22)

Month: February'2022			
Date	**Intake Reservoir (ºC)**	**Outfall channel (ºC)**	**Temp. difference (ºC)**
01/02/2022	26.0	OUM	OUM
02/02/2022	25.5	OUM	OUM
03/02/2022	25.5	OUM	OUM
04/02/2022	25.0	OUM	OUM
05/02/2022	25.0	OUM	OUM
06/02/2022	24.5	OUM	OUM
07/02/2022	24.5	OUM	OUM
08/02/2022	24.5	OUM	OUM
09/02/2022	24.0	OUM	OUM
10/02/2022	24.0	OUM	OUM
11/02/2022	24.5	OUM	OUM
12/02/2022	24.0	OUM	OUM
13/02/2022	23.5	OUM	OUM
14/02/2022	24.0	OUM	OUM
15/02/2022	23.5	OUM	OUM
16/02/2022	24.0	OUM	OUM
17/02/2022	24.5	OUM	OUM
18/02/2022	24.0	OUM	OUM
19/02/2022	24.0	OUM	OUM
20/02/2022	24.5	OUM	OUM
21/02/2022	25.0	OUM	OUM
22/02/2022	25.0	OUM	OUM
23/02/2022	25.0	OUM	OUM
24/02/2022	24.5	OUM	OUM
25/02/2022	24.0	OUM	OUM
26/02/2022	24.5	OUM	OUM
27/02/2022	25.0	OUM	OUM
28/02/2022	25.0	OUM	OUM
Min.	**23.5**	OUM	OUM
Max.	**26.0**	OUM	OUM
Average	**24.5**	OUM	OUM

Note: OUM=Outfall Channel Under Maintenance

adani	Adani Power (Mundra) Limited, Mundra
	Differential Water Temperature Report (October'21 to March'22)

Annexure

Month: March'2022			
Date	**Intake Reservoir (°C)**	**Outfall channel (°C)**	**Temp. difference (°C)**
01/03/2022	25.5	OUM	OUM
02/03/2022	26.0	OUM	OUM
03/03/2022	26.0	OUM	OUM
04/03/2022	26.5	OUM	OUM
05/03/2022	26.0	OUM	OUM
06/03/2022	26.5	OUM	OUM
07/03/2022	26.5	OUM	OUM
08/03/2022	27.0	OUM	OUM
09/03/2022	27.0	OUM	OUM
10/03/2022	26.5	OUM	OUM
11/03/2022	27.0	OUM	OUM
12/03/2022	27.0	OUM	OUM
13/03/2022	27.0	OUM	OUM
14/03/2022	27.0	28.5	1.5
15/03/2022	26.5	28.5	2.0
16/03/2022	27.0	29.0	2.0
17/03/2022	27.5	28.5	1.0
18/03/2022	27.0	29.0	2.0
19/03/2022	27.0	28.5	1.5
20/03/2022	27.5	28.5	1.0
21/03/2022	27.5	29.0	1.5
22/03/2022	27.0	29.0	2.0
23/03/2022	27.5	29.5	2.0
24/03/2022	27.0	29.0	2.0
25/03/2022	27.5	31.0	3.5
26/03/2022	28.0	31.0	3.0
27/03/2022	28.0	30.5	2.5
28/03/2022	28.5	31.0	2.5
29/03/2022	28.0	31.0	3.0
30/03/2022	28.5	30.5	2.0
31/03/2022	28.5	31.0	2.5
Min.	**25.5**	**28.5**	**1.0**
Max.	**28.5**	**31.0**	**3.5**
Average	**27.1**	**29.5**	**2.1**

Note: OUM=Outfall Channel Under Maintenance

adani	Adani Power (Mundra) Limited, Mundra
	Greenbelt Details

Annexure: VI

Greenbelt Details:

Area (ha)	No. of Trees & Palm Planted	No. of Shrubs Planted
141.67	326979	1403954

Plant species planted at Adani Power Limited, Mundra

Sr. No.	Scientific Name	Common Name
Tress		
1.	*Achras sapota*	Sapota / Chiku
2.	*Areca catechu*	Nut Palm tree
3.	*Azadirachta indica*	Neem
4.	*Bismarckia nobilis*	Bismarckia Palm
5.	*Bauhinia blakeana*	Kachnar
6.	*Callistemon viminalis*	Pink Bottle brush
7.	*Callistemon lanceolatus*	Red Bottle brush
8.	*Casuarina equisetifolia*	Saru/Casuarina
9.	*Cocos nucifera*	Nariyal/Cocconut
10.	*Delonix regia*	Gulmohar
11.	*Ficus benghalensis*	Baniyan tree
12.	*Ficus religiosa*	Peepal Tree
13.	*Punica granatum*	Pomegranate
14.	*Emblica officinalis*	Aamla
15.	*Ficus infectoria*	Pilkhan /White Fig tree
16.	*Mangifera indica*	Aam/ Mango
17.	*Polyalthia longifolia*	Ashok/ False Ashok
18.	*Psidium guajava*	Guava
19.	*Salvadora oleoides*	Peelu
20.	*Citrus limon*	Lemon
21.	*Syzygium cumini*	Jamun
22.	*Washingtonia filifera*	Washingtonia Palm
23.	*Wodyetia bifurcata*	Palm
Shrubs		
24.	*Allamanda*	Yellow Bell
25.	*Bougainvillea spectabilis*	Bougainvillea/ Booganbel
26.	*Catharanthus alba*	Vinca
27.	*Clerodendrum inerme*	Wild Jasmine
28.	*Cycas circinalis*	Cycas
29.	*Euphorbia cotinifolia*	Tropical Smoke Bush
30.	*Euphorbia milii*	Christ Thorn
31.	*Ficus panda*	-
32.	*Hymenocallis caroliniana*	Spider Lily
33.	*Ixora hybrid*	Ixora
34.	*Jasminum molle*	Jui
35.	*Jatropha curcas*	Ratanjyot,
36.	*Nerium indicum*	Kaner
37.	*Nerium odoratum*	Kaner
38.	*Plumeria alba*	Champa
39.	*Tecoma*	Yellow Trumpetbush
40.	*Ziziphus mauritiana*	Ber/Bor/Indian plum
41.	*Furcraea macdougalii*	Furcraea
42.	*Nicadevia*	Nicadevia

adani	**Adani Power (Mundra) Limited, Mundra**
	Ash Production & Disposal (October 2021 to March 2022)

Annexure – VII

Month	Total Ash Generation	For Cement Manufacturing (Fly Ash + Bottom Ash + Pond Ash)	For Brick / Construction / Export / Domestic Treaders	Filling of low-lying area	Ash Dyke	Dyke Ash lifted for reutilization Embankment / Back Filling	Bottom Ash lifted for Embankment / Back Filling	Total Ash Utilization	% Utilization	Previous Month's Stock (MT)
										1619
Oct-21	14399	9804	4616	0	0	0	0	14420	100.15	2194
Nov-21	7195	5531	3752	0	0	0	0	9283	129.03	610
Dec-21	17289	11376	3336	0	0	0	2446	17158	99.25	744
Jan-22	17243	9487	4784	0	0	0	2852	17122	99.30	864
Feb-22	9205	4514	4563	0	0	0	275	9351	101.59	718
Mar-22	29423	19327	5988	0	0	7000	3328	35643	121.14	1497
Note: - Total 1497 MT Ash stocked (177 MT Ash in ash silo and 1320 MT Ash filled in bags) and will be utilized in upcoming month										
Total	**94754**	**60039**	**27039**	**0**	**0**	**7000**	**8901**	**102977**	**108.41**	
Note: (i) Total Bottom utilization for Cement industry is 31971 MT (ii) Total Pond Ash utilization for Cement industry is 4646 MT										

adani
Power

Ref: APMuL/Env/GPCB/08/22

Date: 12.01.2022

To,
The Additional Principal Chief Conservator of Forest (APCCF),
Ministry of Environment Forests and Climate Change,
Regional Office, Western Region,
Kendriya Paryavaran Bhavan,
Link Road No. -3, E-5, Ravi Shankar Nagar,
Bhopal – 462 016 (Madhya Pradesh)

Subject: **Advisory regarding implementation of implementation of Notification No. G.S.R. 02(E) dated: 2nd January 2014 for supply and use of coal with ash content - regarding**

Ref: File No. L-11011/21/2014-IA.I (T), dated: 13.04.2015

Dear Sir,

With above subject and reference, we are submitting herewith the compliance of said notification.

The half yearly compliance reports of Fly Ash management for environmental safeguards stipulated in the EC and Consent are being regularly submitted to both the Regional offices of MoEF&CC, Bhopal as well as Gujarat Pollution Control Board (GPCB). We are also submitting the half yearly & annual reports of Fly ash utilization & Ash content of Coal to Central Electricity Authority (CEA) since plant operation.

We are enclosing herewith the monthly as well as **quarterly average ash content** in the coal used by our plant during the period of **October 2021 to December 2021** as Annexure – I.

Total Capacity of TPP: 4620 MW

Phase – I	:	660 (2x330) MW
Phase – II	:	1980 (2x330) + (2x660) MW
Phase – III	:	1980 (3x660) MW

This is for your kind information and record please.

Thanking You,

Yours faithfully,
For Adani Power (Mundra) Limited,

(MUKESH PATEL)
Head – Environment

Encl: As above

Adani Power (Mundra) Limited
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Annexure – I

ADANI POWER (MUNDRA) LIMITED
ASH PERCENTAGE IN COAL

(From October 2021 to December 2021)

Sl. No.	Month	Coal Consumption (MT)	Ash Content in Coal (%)	Quarterly Average (%)
1	October 2021	422381	3.4	5.5
2	November 2021	101150	7.1	
3	December 2021	287100	6.0	

Ref: APMuL/ENV/4Q/FAG&U/411
Date: 09.04.2022

To,
The Additional Principal Chief Conservator of Forest (APCCF),
Ministry of Environment Forests and Climate Change,
Regional Office, Western Region,
Kendriya Paryavaran Bhavan,
Link Road No. -3, E-5, Ravi Shankar Nagar,
Bhopal – 462 016 (Madhya Pradesh)

Subject: **Advisory regarding implementation of implementation of Notification No. G.S.R. 2(E) dated: 2nd January 2014 for supply and use of coal with ash content - regarding**

Ref: File No. L-11011/21/2014-IA.I (T), dated: 13.04.2015

Dear Sir,

With above subject and reference, we are submitting herewith the compliance of said notification.

The half yearly compliance reports of Fly Ash management for environmental safeguards stipulated in the EC and Consent are being regularly submitted to both the regional offices of MoEF&CC, Bhopal as well as Gujarat Pollution Control Board (GPCB). We are also submitting the half yearly & annual reports of Fly ash utilization & Ash content of Coal to Central Electricity Authority (CEA) since plant operation.

We are enclosing herewith the monthly as well as **quarterly average ash content** in the coal used by our plant during the period of **January 2022 to March 2022** as Annexure – I.

Total Capacity of TPP: **4620 MW**

Phase – I	:	660 (2x330) MW
Phase – II	:	1980 (2x330) + (2x660) MW
Phase – III	:	1980 (3x660) MW

This is for your kind information and record please.

Thanking You,

Yours faithfully,
For Adani Power (Mundra) Limited,

(R N Shukla)
Head – Environment

Encl: As above

Adani Power (Mundra) Limited
Village Tunda & Siracha
Taluka Mundra
Mundra, Kutch 370 435
Gujarat, India

Tel +91 2838 266128
Fax +91 2838 266129
info@adani.com
www.adani.com

Registered Office: Adani House, Shantigram, S G Highway, Ahmedabad 382 421, Gujarat, India

Annexure – I

ADANI POWER (MUNDRA) LIMITED

ASH PERCENTAGE IN COAL

(From January' 2022 to March' 2022)

Sl. No.	Month	Coal Consumption (MT)	Ash Content in Coal (%)
1	January 2022	278,126	6.20
2	February 2022	186,516	4.94
3	March 2022	639,126	4.60
Quarterly Average (%)			5.25

MT: Metric Tonne

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TEST REPORT

ULR No.	--	Report No.	**URC /21/12/L-0221**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**23/12/2021**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 1**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**15/12/2021**	Sample Received Date	**17/12/2021**
Test Started Date	**17/12/2021**	Test Completion Date	**20/12/2021**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID.No.	**21/12/L-0221**		

TEST RESULTS:

DISCIPLINE : Chemical Testing			**NAME OF GROUP: Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		PHYSIO-CHEMICAL PARAMETERS		
1.	pH @ 25 ° C	IS 3025(Part 11)1983	--	7.59
2.	Conductivity	IS 3025(Part 14)1984	(µS/cm)	15250
3.	Total Dissolved Solids	(APHA 23rd Ed.,2017,2540- C)	mg/L	9760
		GENERAL CHEMICAL PARAMETERS		
1.	Chloride as Cl^-	(APHA 23rd Ed.,2017,4500-Cl)	mg/L	4649
2.	Carbonate as CaCO3	IS 3025(Part 51)2001	mg/L	21.3
3.	Bicarbonate as CaCO3	IS 3025(Part 51)2001	mg/L	207.3
4.	Total Alkalinity	[IS 3025(Part 23)1986, Amd.2]	mg/L	370
5.	Calcium as Ca	(APHA 23rd Ed.,2017,3500 Ca.B)	mg/L	328.9
6.	Magnesium as Mg	(APHA 23rd Ed.,2017,, 3500 Mg.B)	mg/L	229.4
7.	Sodium as Na	APHA 23rd Ed.,2017,3500 Na,B	mg/L	1476
8.	Potassium as K	APHA 23rd Ed.,2017,3500 K,B	mg/L	82.40
9.	Sulphate as SO4-2	IS 3025(Part 24)1986	mg/L	586
10.	Nitrate as NO3	(APHA 23rd Ed.,2017,4500 NO3-B)	mg/L	27
11.	Phosphate as PO_4	(APHA 23rd Ed.,2017,4500-P,D)	mg/L	3
12.	Fluoride as F	(APHA 23rd Ed.,2017,4500 F,D)	mg/L	2.5
DISCIPLINE : Chemical Testing			**NAME OF GROUP: Residues in Water**	
13	Mercury as Hg	(APHA 23rd Ed.,2017,3112-B)	mg/L	BDL(MDL:0.001)
14	Arsenic as As	APHA 23rd Ed.,2017,3114-C	mg/L	BDL(MDL:0.01)
15	Lead as Pb	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.01)
16	Chromium as Cr	APHA 23rd Ed.,2017,3125	mg/L	BDL(MDL:0.05)
17	Cadmium as Cd	IS 3025(Part 41)1992, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.003)
18	Iron (as Fe)	IS 3025(Part 53)2003, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.1)
19	Zinc (as Zn)	IS 3025(Part 49)1994, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)
20	Cobalt as Co	APHA 23rdEd.2017-3500-Co	mg/L	BDL(MDL:0.1)
21	Copper as Cu	IS 3025(Part 42)1992amd.01, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)

Note: This report is subject to terms and conditions mentioned overleaf.

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TEST REPORT

ULR No.	--	Report No.	**URC /21/12/L-0221**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**23/12/2021**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 1**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**15/12/2021**	Sample Received Date	**17/12/2021**
Test Started Date	**17/12/2021**	Test Completion Date	**20/12/2021**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID.No.	**21/12/L-0221**		

TEST RESULTS:

DISCIPLINE: Chemical Testing			**NAME OF GROUP: Residues in Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
GENERAL CHEMICAL PARAMETERS				
22.	Manganese as Mn	APHA 23rd Ed.,2017,3500 Mn B	mg/L	BDL(MDL:0.1)
23.	Nickel as Ni	IS 3025(Part 54)2003, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.02)
Remarks: BDL= Below Detection Limit, **MDL** = Minimum Detection Limit,				
Opinion & Interpretation (If required): --				

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

Checked By:
Nilesh C. Patel
(Sr. Chemist)

Authorized By:
Nitin B. Tandel
(Technical Manager)

Note: This report is subject to terms and conditions mentioned overleaf.

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TEST REPORT

ULR No.	--	Report No.	**URC /21/12/L-0221**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**23/12/2021**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 1**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**15/12/2021**	Sample Received Date	**17/12/2021**
Test Started Date	**17/12/2021**	Test Completion Date	**20/12/2021**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID.No.	**21/12/L-0221**		

TEST RESULTS:

DISCIPLINE : Chemical Testing			**NAME OF GROUP: Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		GENERAL CHEMICAL PARAMETERS		
1.	Salinity	By Calculation	ppt	7.4
DISCIPLINE: Chemical Testing			**NAME OF GROUP: Residues in Water**	
2.	Barium as Ba	AAS Method	mg/L	N.D.
Remarks: N.D. = Not Detectable,				
Opinion & Interpretation (If required): --				

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

Checked By:
Nilesh C. Patel
(Sr. Chemist)

Authorized By:
Nitin B. Tandel
(Technical Manager)

Note: This report is subject to terms and conditions mentioned overleaf.

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TEST REPORT

ULR No.	--	Report No.	**URC /21/12/L-0222**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**23/12/2021**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 2**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**15/12/2021**	Sample Received Date	**17/12/2021**
Test Started Date	**17/12/2021**	Test Completion Date	**20/12/2021**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID.No.	**21/12/L-0222**		

TEST RESULTS:

DISCIPLINE : Chemical Testing			**NAME OF GROUP: Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		PHYSIO-CHEMICAL PARAMETERS		
1.	pH @ 25 ° C	IS 3025(Part 11)1983	--	7.56
2.	Conductivity	IS 3025(Part 14)1984	(µS/cm)	17320
3.	Total Dissolved Solids	(APHA 23rd Ed.,2017,2540- C)	mg/L	11088
		GENERAL CHEMICAL PARAMETERS		
1.	Chloride as Cl^-	(APHA 23rd Ed.,2017,4500-Cl)	mg/L	4450
2.	Carbonate as CaCO3	IS 3025(Part 51)2001	mg/L	26.0
3.	Bicarbonate as CaCO3	IS 3025(Part 51)2001	mg/L	208.6
4.	Total Alkalinity	[IS 3025(Part 23)1986, Amd.2]	mg/L	410.4
5.	Calcium as Ca	(APHA 23rd Ed.,2017,3500 Ca.B)	mg/L	322.4
6.	Magnesium as Mg	(APHA 23rd Ed.,2017,, 3500 Mg.B)	mg/L	201.6
7.	Sodium as Na	APHA 23rd Ed.,2017,3500 Na,B	mg/L	1982
8.	Potassium as K	APHA 23rd Ed.,2017,3500 K,B	mg/L	118.6
9.	Sulphate as SO4-2	IS 3025(Part 24)1986	mg/L	792
10.	Nitrate as NO3	(APHA 23rd Ed.,2017,4500 NO3-B)	mg/L	29
11.	Phosphate as PO_4	(APHA 23rd Ed.,2017,4500-P,D)	mg/L	3.02
12.	Fluoride as F	(APHA 23rd Ed.,2017,4500 F,D)	mg/L	2.38
DISCIPLINE : Chemical Testing			**NAME OF GROUP: Residues in Water**	
13	Mercury as Hg	(APHA 23rd Ed.,2017,3112-B)	mg/L	BDL(MDL:0.001)
14	Arsenic as As	APHA 23rd Ed.,2017,3114-C	mg/L	BDL(MDL:0.01)
15	Lead as Pb	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.01)
16	Chromium as Cr	APHA 23rd Ed.,2017,3125	mg/L	BDL(MDL:0.05)
17	Cadmium as Cd	IS 3025(Part 41)1992, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.003)
18	Iron (as Fe)	IS 3025(Part 53)2003, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.1)
19	Zinc (as Zn)	IS 3025(Part 49)1994, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)
20	Cobalt as Co	APHA 23rdEd.2017-3500-Co	mg/L	BDL(MDL:0.1)
21	Copper as Cu	IS 3025(Part 42)1992amd.01, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)

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TEST REPORT

ULR No.	--	Report No.	**URC /21/12/L-0222**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**23/12/2021**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 2**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**15/12/2021**	Sample Received Date	**17/12/2021**
Test Started Date	**17/12/2021**	Test Completion Date	**20/12/2021**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID.No.	**21/12/L-0222**		

TEST RESULTS:

DISCIPLINE: Chemical Testing			**NAME OF GROUP: Residues in Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		GENERAL CHEMICAL PARAMETERS		
22.	Manganese as Mn	APHA 23rd Ed.,2017,3500 Mn B	mg/L	BDL(MDL:0.1)
23.	Nickel as Ni	IS 3025(Part 54)2003, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.02)
Remarks: BDL= Below Detection Limit, **MDL** = Minimum Detection Limit,				
Opinion & Interpretation (If required): --				

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

Checked By:
Nilesh C. Patel
(Sr. Chemist)

Authorized By:
Nitin B. Tandel
(Technical Manager)

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TEST REPORT

ULR No.	--	Report No.	**URC /21/12/L-0222**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**23/12/2021**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 2**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**15/12/2021**	Sample Received Date	**17/12/2021**
Test Started Date	**17/12/2021**	Test Completion Date	**20/12/2021**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID.No.	**21/12/L-0222**		

TEST RESULTS:

DISCIPLINE : Chemical Testing			**NAME OF GROUP: Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		GENERAL CHEMICAL PARAMETERS		
1.	Salinity	By Calculation	ppt	8.04
DISCIPLINE: Chemical Testing			**NAME OF GROUP: Residues in Water**	
2.	Barium as Ba	AAS Method	mg/L	N.D.
Remarks: N.D. = Not Detectable,				
Opinion & Interpretation (If required): --				

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

Checked By:
Nilesh C. Patel
(Sr. Chemist)

Authorized By:
Nitin B. Tandel
(Technical Manager)

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TEST REPORT

ULR No.	--	Report No.	**URC /21/12/L-0223**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**23/12/2021**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 3**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**15/12/2021**	Sample Received Date	**17/12/2021**
Test Started Date	**17/12/2021**	Test Completion Date	**20/12/2021**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID.No.	**21/12/L-0223**		

TEST RESULTS:

DISCIPLINE : Chemical Testing			**NAME OF GROUP: Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		PHYSIO-CHEMICAL PARAMETERS		
1.	pH @ 25 ° C	IS 3025(Part 11)1983	--	7.59
2.	Conductivity	IS 3025(Part 14)1984	(µS/cm)	15250
3.	Total Dissolved Solids	(APHA 23rd Ed.,2017,2540- C)	mg/L	9764
		GENERAL CHEMICAL PARAMETERS		
1.	Chloride as Cl^-	(APHA 23rd Ed.,2017,4500-Cl)	mg/L	4323.5
2.	Carbonate as CaCO3	IS 3025(Part 51)2001	mg/L	31.5
3.	Bicarbonate as CaCO3	IS 3025(Part 51)2001	mg/L	160.5
4.	Total Alkalinity	[IS 3025(Part 23)1986, Amd.2]	mg/L	334.4
5.	Calcium as Ca	(APHA 23rd Ed.,2017,3500 Ca.B)	mg/L	292.0
6.	Magnesium as Mg	(APHA 23rd Ed.,2017,, 3500 Mg.B)	mg/L	153.4
7.	Sodium as Na	APHA 23rd Ed.,2017,3500 Na,B	mg/L	1202
8.	Potassium as K	APHA 23rd Ed.,2017,3500 K,B	mg/L	64.6
9.	Sulphate as SO4-2	IS 3025(Part 24)1986	mg/L	592.8
10.	Nitrate as NO3	(APHA 23rd Ed.,2017,4500 NO3-B)	mg/L	23.6
11.	Phosphate as PO_4	(APHA 23rd Ed.,2017,4500-P,D)	mg/L	2.12
12.	Fluoride as F	(APHA 23rd Ed.,2017,4500 F,D)	mg/L	2.1
DISCIPLINE : Chemical Testing			**NAME OF GROUP: Residues in Water**	
13	Mercury as Hg	(APHA 23rd Ed.,2017,3112-B)	mg/L	BDL(MDL:0.001)
14	Arsenic as As	APHA 23rd Ed.,2017,3114-C	mg/L	BDL(MDL:0.01)
15	Lead as Pb	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.01)
16	Chromium as Cr	APHA 23rd Ed.,2017,3125	mg/L	BDL(MDL:0.05)
17	Cadmium as Cd	IS 3025(Part 41)1992, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.003)
18	Iron (as Fe)	IS 3025(Part 53)2003, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.1)
19	Zinc (as Zn)	IS 3025(Part 49)1994, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)
20	Cobalt as Co	APHA 23rdEd.2017-3500-Co	mg/L	BDL(MDL:0.1)
21	Copper as Cu	IS 3025(Part 42)1992amd.01, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)

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TEST REPORT

ULR No.	--	Report No.	**URC /21/12/L-0223**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**23/12/2021**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 3**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**15/12/2021**	Sample Received Date	**17/12/2021**
Test Started Date	**17/12/2021**	Test Completion Date	**20/12/2021**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID.No.	**21/12/L-0223**		

TEST RESULTS:

DISCIPLINE: Chemical Testing			**NAME OF GROUP: Residues in Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		GENERAL CHEMICAL PARAMETERS		
22.	Manganese as Mn	APHA 23rd Ed.,2017,3500 Mn B	mg/L	BDL(MDL:0.1)
23.	Nickel as Ni	IS 3025(Part 54)2003, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.02)
Remarks: BDL= Below Detection Limit, **MDL** = Minimum Detection Limit,				
Opinion & Interpretation (If required): --				

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

Checked By:
Nilesh C. Patel
(Sr. Chemist)

Authorized By:
Nitin B. Tandel
(Technical Manager)

Note: This report is subject to terms and conditions mentioned overleaf.

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TEST REPORT

ULR No.	--	Report No.	**URC /21/12/L-0223**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**23/12/2021**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 3**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**15/12/2021**	Sample Received Date	**17/12/2021**
Test Started Date	**17/12/2021**	Test Completion Date	**20/12/2021**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID.No.	**21/12/L-0223**		

TEST RESULTS:

DISCIPLINE : Chemical Testing			**NAME OF GROUP: Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		GENERAL CHEMICAL PARAMETERS		
1.	Salinity	By Calculation	ppt	7.76
DISCIPLINE: Chemical Testing			**NAME OF GROUP: Residues in Water**	
2.	Barium as Ba	AAS Method	mg/L	N.D.
Remarks: N.D. = Not Detectable,				
Opinion & Interpretation (If required): --				

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

Checked By:
Nilesh C. Patel
(Sr. Chemist)

Authorized By:
Nitin B. Tandel
(Technical Manager)

Note: This report is subject to terms and conditions mentioned overleaf.

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TEST REPORT

ULR No.	--	Report No.	**URC /21/12/L-0224**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**23/12/2021**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 4**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**15/12/2021**	Sample Received Date	**17/12/2021**
Test Started Date	**17/12/2021**	Test Completion Date	**20/12/2021**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID.No.	**21/12/L-0224**		

TEST RESULTS:

DISCIPLINE : Chemical Testing			**NAME OF GROUP: Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		PHYSIO-CHEMICAL PARAMETERS		
1.	pH @ 25 ° C	IS 3025(Part 11)1983	--	7.41
2.	Conductivity	IS 3025(Part 14)1984	(µS/cm)	15690
3.	Total Dissolved Solids	(APHA 23rd Ed.,2017,2540- C)	mg/L	10274
		GENERAL CHEMICAL PARAMETERS		
1.	Chloride as Cl^-	(APHA 23rd Ed.,2017,4500-Cl)	mg/L	4463.2
2.	Carbonate as CaCO3	IS 3025(Part 51)2001	mg/L	28.8
3.	Bicarbonate as CaCO3	IS 3025(Part 51)2001	mg/L	185.5
4.	Total Alkalinity	[IS 3025(Part 23)1986, Amd.2]	mg/L	431.2
5.	Calcium as Ca	(APHA 23rd Ed.,2017,3500 Ca.B)	mg/L	378.8
6.	Magnesium as Mg	(APHA 23rd Ed.,2017,, 3500 Mg.B)	mg/L	216.3
7.	Sodium as Na	APHA 23rd Ed.,2017,3500 Na,B	mg/L	1576
8.	Potassium as K	APHA 23rd Ed.,2017,3500 K,B	mg/L	86.4
9.	Sulphate as SO4-2	IS 3025(Part 24)1986	mg/L	690.8
10.	Nitrate as NO3	(APHA 23rd Ed.,2017,4500 NO3-B)	mg/L	28.11
11.	Phosphate as PO_4	(APHA 23rd Ed.,2017,4500-P,D)	mg/L	2.26
12.	Fluoride as F	(APHA 23rd Ed.,2017,4500 F,D)	mg/L	2.62
DISCIPLINE : Chemical Testing			**NAME OF GROUP: Residues in Water**	
13	Mercury as Hg	(APHA 23rd Ed.,2017,3112-B)	mg/L	BDL(MDL:0.001)
14	Arsenic as As	APHA 23rd Ed.,2017,3114-C	mg/L	BDL(MDL:0.01)
15	Lead as Pb	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.01)
16	Chromium as Cr	APHA 23rd Ed.,2017,3125	mg/L	BDL(MDL:0.05)
17	Cadmium as Cd	IS 3025(Part 41)1992, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.003)
18	Iron (as Fe)	IS 3025(Part 53)2003, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.1)
19	Zinc (as Zn)	IS 3025(Part 49)1994, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)
20	Cobalt as Co	APHA 23rdEd.2017-3500-Co	mg/L	BDL(MDL:0.1)
21	Copper as Cu	IS 3025(Part 42)1992amd.01, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)

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TEST REPORT

ULR No.	--	Report No.	**URC /21/12/L-0224**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**23/12/2021**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 4**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**15/12/2021**	Sample Received Date	**17/12/2021**
Test Started Date	**17/12/2021**	Test Completion Date	**20/12/2021**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID.No.	**21/12/L-0224**		

TEST RESULTS:

DISCIPLINE: Chemical Testing			**NAME OF GROUP: Residues in Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		GENERAL CHEMICAL PARAMETERS		
22.	Manganese as Mn	APHA 23rd Ed.,2017,3500 Mn B	mg/L	BDL(MDL:0.1)
23.	Nickel as Ni	IS 3025(Part 54)2003, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.02)
Remarks: BDL= Below Detection Limit, **MDL** = Minimum Detection Limit,				
Opinion & Interpretation (If required): --				

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

Checked By:
Nilesh C. Patel
(Sr. Chemist)

Authorized By:
Nitin B. Tandel
(Technical Manager)

Note: This report is subject to terms and conditions mentioned overleaf.

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TEST REPORT

ULR No.	--	Report No.	**URC /21/12/L-0224**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**23/12/2021**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 4**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**15/12/2021**	Sample Received Date	**17/12/2021**
Test Started Date	**17/12/2021**	Test Completion Date	**20/12/2021**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID.No.	**21/12/L-0224**		

TEST RESULTS:

DISCIPLINE : Chemical Testing			**NAME OF GROUP: Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		GENERAL CHEMICAL PARAMETERS		
1.	Salinity	By Calculation	ppt	8.0
DISCIPLINE: Chemical Testing			**NAME OF GROUP: Residues in Water**	
2.	Barium as Ba	AAS Method	mg/L	N.D.
Remarks: N.D. = Not Detectable,				
Opinion & Interpretation (If required): --				

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

Checked By:
Nilesh C. Patel
(Sr. Chemist)

Authorized By:
Nitin B. Tandel
(Technical Manager)

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TEST REPORT

ULR No.	--	Report No.	**URC /21/12/APML-0352**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**28/12/2021**
		Customer's Ref.	--
Sample Details	**Coal Sample**	Location	--
Sample Qty.	**1 Kg.**	Appearance	**Black Color**
Sampling Date	**14/12/2021**	Sample Received Date	**16/12/2021**
Test Started Date	**17/12/2021**	Test Completion Date	**24/12/2021**
Sampled By	**APMuL**	Sampling Method	--
UERL Lab ID. No.	**21/12/APML-0352**		

TEST RESULTS

Sr. No.	Parameters	Unit Of Measurement	Results
1.	Gross Calorific Value	Kcal/kg	4221
2.	Sulpher Content	%	0.22
3.	Ash Content	%	6.02
4.	Lead as Pb	mg/kg	0.032
5..	Total Chromium as Cr	mg/kg	0.041
6.	Cadmium as Cd	mg/kg	0.024
7.	Arsenic as As	mg/kg	N.D.
8.	Mercury as Hg	mg/kg	N.D.
9.	Nickel as Ni	mg/kg	0.044

Note: Not Detectable.

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

Checked By:
Nilesh C. Patel
(Sr. Chemist)

Authorized By:
Nitin B. Tandel
(Technical Manager)

UERL/CHM/F–2/05

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TEST REPORT

ULR No.	--	Report No.	**URC /22/03/L-0339**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**30/03/2022**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 1**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**23/03/2022**	Sample Received Date	**25/03/2022**
Test Started Date	**25/03/2022**	Test Completion Date	**29/03/2022**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID. No.	**22/03/L-0339**		

TEST RESULTS:

DISCIPLINE : Chemical Testing			**NAME OF GROUP: Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		PHYSIO-CHEMICAL PARAMETERS		
1.	pH @ 25 ° C	IS 3025(Part 11)1983	--	7.69
2.	Conductivity	IS 3025(Part 14)1984	(µS/cm)	15470
3.	Total Dissolved Solids	(APHA 23rd Ed.,2017,2540- C)	mg/L	9856
		GENERAL CHEMICAL PARAMETERS		
1.	Chloride as Cl^-	(APHA 23rd Ed.,2017,4500-Cl)	mg/L	4675
2.	Carbonate as CaCO3	IS 3025(Part 51)2001	mg/L	22.5
3.	Bicarbonate as CaCO3	IS 3025(Part 51)2001	mg/L	214.4
4.	Total Alkalinity	[IS 3025(Part 23)1986, Amd.2]	mg/L	382.2
5.	Calcium as Ca	(APHA 23rd Ed.,2017,3500 Ca.B)	mg/L	329.5
6.	Magnesium as Mg	(APHA 23rd Ed.,2017,, 3500 Mg.B)	mg/L	234.1
7.	Sodium as Na	APHA 23rd Ed.,2017,3500 Na,B	mg/L	1495
8.	Potassium as K	APHA 23rd Ed.,2017,3500 K,B	mg/L	86.7
9.	Sulphate as SO4-2	IS 3025(Part 24)1986	mg/L	597.3
10.	Nitrate as NO3	(APHA 23rd Ed.,2017,4500 NO3-B)	mg/L	27.6
11.	Phosphate as PO_4	(APHA 23rd Ed.,2017,4500-P,D)	mg/L	3.15
12.	Fluoride as F	(APHA 23rd Ed.,2017,4500 F,D)	mg/L	2.7
DISCIPLINE : Chemical Testing			**NAME OF GROUP: Residues and Contaminants in Water**	
13	Mercury as Hg	(APHA 23rd Ed.,2017,3112-B)	mg/L	BDL(MDL:0.001)
14	Arsenic as As	APHA 23rd Ed.,2017,3114-C	mg/L	BDL(MDL:0.01)
15	Lead as Pb	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.01)
16	Chromium as Cr	APHA 23rd Ed.,2017,3125	mg/L	BDL(MDL:0.05)
17	Cadmium as Cd	IS 3025(Part 41)1992, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.003)
18	Iron (as Fe)	IS 3025(Part 53)2003, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.1)
19	Zinc (as Zn)	IS 3025(Part 49)1994, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)
20	Cobalt as Co	APHA 23rdEd.2017-3500-Co	mg/L	BDL(MDL:0.1)
21	Copper as Cu	IS 3025(Part 42)1992amd.01, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)

Note: This report is subject to terms and conditions mentioned overleaf.

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TEST REPORT

ULR No.	--	Report No.	**URC /22/03/L-0339**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**30/03/2022**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 1**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**23/03/2022**	Sample Received Date	**25/03/2022**
Test Started Date	**25/03/2022**	Test Completion Date	**29/03/2022**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID. No.	**22/03/L-0339**		

TEST RESULTS:

DISCIPLINE: Chemical Testing			**NAME OF GROUP: Residues and Contaminants in Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		GENERAL CHEMICAL PARAMETERS		
22.	Manganese as Mn	APHA 23rd Ed.,2017,3500 Mn B	mg/L	BDL(MDL:0.1)
23.	Nickel as Ni	IS 3025(Part 54)2003, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.02)
Remarks: BDL= Below Detection Limit, **MDL** = Minimum Detection Limit,				
Opinion & Interpretation (If required): --				

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

Checked By:
Nilesh C. Patel
(Sr. Chemist)
Page No.: 2 of 2

Authorized By:
Nitin B. Tandel
(Technical Manager)
UERL/CHM/F-2/05

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TEST REPORT

ULR No.	--	Report No.	**URC /22/03/L-0339**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**30/03/2022**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 1**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**23/03/2022**	Sample Received Date	**25/03/2022**
Test Started Date	**25/03/2022**	Test Completion Date	**29/03/2022**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID. No.	**22/03/L-0339**		

TEST RESULTS:

DISCIPLINE : Chemical Testing			**NAME OF GROUP: Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		GENERAL CHEMICAL PARAMETERS		
1.	Salinity	By Calculation	ppt	8.44
DISCIPLINE: Chemical Testing			**NAME OF GROUP: Residues and Contaminants in Water**	
2.	Barium as Ba	AAS Method	mg/L	N.D.
Remarks: N.D. = Not Detectable,				
Opinion & Interpretation (If required): --				

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

Checked By:
Nilesh C. Patel
(Sr. Chemist)
Page No.: 1 of 1

Authorized By:
Nitin B. Tandel
(Technical Manager)
UERL/CHM/F-2/05

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TEST REPORT

ULR No.	--	Report No.	**URC /22/03/L-0340**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**30/03/2022**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 2**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**23/03/2022**	Sample Received Date	**25/03/2022**
Test Started Date	**25/03/2022**	Test Completion Date	**29/03/2022**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID. No.	**22/03/L-0340**		

TEST RESULTS:

DISCIPLINE : Chemical Testing			**NAME OF GROUP: Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		PHYSIO-CHEMICAL PARAMETERS		
1.	pH @ 25 ° C	IS 3025(Part 11)1983	--	7.57
2.	Conductivity	IS 3025(Part 14)1984	(µS/cm)	17460
3.	Total Dissolved Solids	(APHA 23rd Ed.,2017,2540- C)	mg/L	11224
		GENERAL CHEMICAL PARAMETERS		
1.	Chloride as Cl^-	(APHA 23rd Ed.,2017,4500-Cl)	mg/L	4525.6
2.	Carbonate as CaCO3	IS 3025(Part 51)2001	mg/L	27.3
3.	Bicarbonate as CaCO3	IS 3025(Part 51)2001	mg/L	218.3
4.	Total Alkalinity	[IS 3025(Part 23)1986, Amd.2]	mg/L	405.3
5.	Calcium as Ca	(APHA 23rd Ed.,2017,3500 Ca.B)	mg/L	332.1
6.	Magnesium as Mg	(APHA 23rd Ed.,2017,, 3500 Mg.B)	mg/L	202.7
7.	Sodium as Na	APHA 23rd Ed.,2017,3500 Na,B	mg/L	1956
8.	Potassium as K	APHA 23rd Ed.,2017,3500 K,B	mg/L	121.2
9.	Sulphate as SO4-2	IS 3025(Part 24)1986	mg/L	796.5
10.	Nitrate as NO3	(APHA 23rd Ed.,2017,4500 NO3-B)	mg/L	29.5
11.	Phosphate as PO_4	(APHA 23rd Ed.,2017,4500-P,D)	mg/L	3.1
12.	Fluoride as F	(APHA 23rd Ed.,2017,4500 F,D)	mg/L	2.45
DISCIPLINE : Chemical Testing			**NAME OF GROUP: Residues and Contaminants in Water**	
13	Mercury as Hg	(APHA 23rd Ed.,2017,3112-B)	mg/L	BDL(MDL:0.001)
14	Arsenic as As	APHA 23rd Ed.,2017,3114-C	mg/L	BDL(MDL:0.01)
15	Lead as Pb	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.01)
16	Chromium as Cr	APHA 23rd Ed.,2017,3125	mg/L	BDL(MDL:0.05)
17	Cadmium as Cd	IS 3025(Part 41)1992, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.003)
18	Iron (as Fe)	IS 3025(Part 53)2003, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.1)
19	Zinc (as Zn)	IS 3025(Part 49)1994, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)
20	Cobalt as Co	APHA 23rdEd.2017-3500-Co	mg/L	BDL(MDL:0.1)
21	Copper as Cu	IS 3025(Part 42)1992amd.01, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)

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TEST REPORT

ULR No.	--	Report No.	**URC /22/03/L-0340**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**30/03/2022**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 2**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**23/03/2022**	Sample Received Date	**25/03/2022**
Test Started Date	**25/03/2022**	Test Completion Date	**29/03/2022**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID. No.	**22/03/L-0340**		

TEST RESULTS:

DISCIPLINE: Chemical Testing			**NAME OF GROUP: Residues and Contaminants in Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		GENERAL CHEMICAL PARAMETERS		
22.	Manganese as Mn	APHA 23rd Ed.,2017,3500 Mn B	mg/L	BDL(MDL:0.1)
23.	Nickel as Ni	IS 3025(Part 54)2003, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.02)
Remarks: BDL= Below Detection Limit, **MDL** = Minimum Detection Limit,				
Opinion & Interpretation (If required): --				

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

Checked By:
Nilesh C. Patel
(Sr. Chemist)
Page No.: 2 of 2

Authorized By:
Nitin B. Tandel
(Technical Manager)
UERL/CHM/F-2/05

Note: This report is subject to Terms and Conditions mentioned overleaf.

UniStar
Environment and Research Labs Pvt. Ltd.

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TEST REPORT

ULR No.	--	Report No.	**URC /22/03/L-0340**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**30/03/2022**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 2**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**23/03/2022**	Sample Received Date	**25/03/2022**
Test Started Date	**25/03/2022**	Test Completion Date	**29/03/2022**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID. No.	**22/03/L-0340**		

TEST RESULTS:

DISCIPLINE : Chemical Testing			**NAME OF GROUP: Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		GENERAL CHEMICAL PARAMETERS		
1.	Salinity	By Calculation	ppt	8.17
DISCIPLINE: Chemical Testing			**NAME OF GROUP: Residues and Contaminants in Water**	
2.	Barium as Ba	AAS Method	mg/L	N.D.
Remarks: N.D. = Not Detectable,				
Opinion & Interpretation (If required): --				

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

Checked By:
Nilesh C. Patel
(Sr. Chemist)
Page No.: 1 of 1

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TEST REPORT

ULR No.	--	Report No.	**URC /22/03/L-0341**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**30/03/2022**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 3**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**23/03/2022**	Sample Received Date	**25/03/2022**
Test Started Date	**25/03/2022**	Test Completion Date	**29/03/2022**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID. No.	**22/03/L-0341**		

TEST RESULTS:

DISCIPLINE : Chemical Testing			**NAME OF GROUP: Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		PHYSIO-CHEMICAL PARAMETERS		
1.	pH @ 25 ° C	IS 3025(Part 11)1983	--	7.73
2.	Conductivity	IS 3025(Part 14)1984	(µS/cm)	14720
3.	Total Dissolved Solids	(APHA 23rd Ed.,2017,2540- C)	mg/L	9862
		GENERAL CHEMICAL PARAMETERS		
1.	Chloride as Cl^-	(APHA 23rd Ed.,2017,4500-Cl)	mg/L	4396.5
2.	Carbonate as CaCO3	IS 3025(Part 51)2001	mg/L	31.5
3.	Bicarbonate as CaCO3	IS 3025(Part 51)2001	mg/L	165.3
4.	Total Alkalinity	[IS 3025(Part 23)1986, Amd.2]	mg/L	378.6
5.	Calcium as Ca	(APHA 23rd Ed.,2017,3500 Ca.B)	mg/L	296.3
6.	Magnesium as Mg	(APHA 23rd Ed.,2017,, 3500 Mg.B)	mg/L	167.8
7.	Sodium as Na	APHA 23rd Ed.,2017,3500 Na,B	mg/L	1244
8.	Potassium as K	APHA 23rd Ed.,2017,3500 K,B	mg/L	70.2
9.	Sulphate as SO4-2	IS 3025(Part 24)1986	mg/L	623.2
10.	Nitrate as NO3	(APHA 23rd Ed.,2017,4500 NO3-B)	mg/L	24.5
11.	Phosphate as PO_4	(APHA 23rd Ed.,2017,4500-P,D)	mg/L	2.15
12.	Fluoride as F	(APHA 23rd Ed.,2017,4500 F,D)	mg/L	2.5
DISCIPLINE : Chemical Testing			**NAME OF GROUP: Residues and Contaminants in Water**	
13	Mercury as Hg	(APHA 23rd Ed.,2017,3112-B)	mg/L	BDL(MDL:0.001)
14	Arsenic as As	APHA 23rd Ed.,2017,3114-C	mg/L	BDL(MDL:0.01)
15	Lead as Pb	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.01)
16	Chromium as Cr	APHA 23rd Ed.,2017,3125	mg/L	BDL(MDL:0.05)
17	Cadmium as Cd	IS 3025(Part 41)1992, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.003)
18	Iron (as Fe)	IS 3025(Part 53)2003, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.1)
19	Zinc (as Zn)	IS 3025(Part 49)1994, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)
20	Cobalt as Co	APHA 23rdEd.2017-3500-Co	mg/L	BDL(MDL:0.1)
21	Copper as Cu	IS 3025(Part 42)1992amd.01, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)

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TEST REPORT

ULR No.	--	Report No.	**URC /22/03/L-0341**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**30/03/2022**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 3**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**23/03/2022**	Sample Received Date	**25/03/2022**
Test Started Date	**25/03/2022**	Test Completion Date	**29/03/2022**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID. No.	**22/03/L-0341**		

TEST RESULTS:

DISCIPLINE: Chemical Testing			**NAME OF GROUP: Residues and Contaminants in Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		GENERAL CHEMICAL PARAMETERS		
22.	Manganese as Mn	APHA 23rd Ed.,2017,3500 Mn B	mg/L	BDL(MDL:0.1)
23.	Nickel as Ni	IS 3025(Part 54)2003, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.02)
Remarks: BDL= Below Detection Limit, **MDL** = Minimum Detection Limit,				
Opinion & Interpretation (If required): --				

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

Checked By:
Nilesh C. Patel
(Sr. Chemist)
Page No.: 2 of 2

Authorized By:
Nitin B. Tandel
(Technical Manager)
UERL/CHM/F-2/05

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TEST REPORT

ULR No.	--	Report No.	**URC /22/03/L-0341**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**30/03/2022**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 3**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**23/03/2022**	Sample Received Date	**25/03/2022**
Test Started Date	**25/03/2022**	Test Completion Date	**29/03/2022**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID. No.	**22/03/L-0341**		

TEST RESULTS:

DISCIPLINE : Chemical Testing			**NAME OF GROUP: Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		GENERAL CHEMICAL PARAMETERS		
1.	Salinity	By Calculation	ppt	7.94
DISCIPLINE: Chemical Testing			**NAME OF GROUP: Residues and Contaminants in Water**	
2.	Barium as Ba	AAS Method	mg/L	N.D.
Remarks: N.D. = Not Detectable,				
Opinion & Interpretation (If required): --				

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

Checked By:
Nilesh C. Patel
(Sr. Chemist)
Page No.: 1 of 1

Authorized By:
Nitin B. Tandel
(Technical Manager)
UERL/CHM/F-2/05

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TEST REPORT

ULR No.	--	Report No.	**URC /22/03/L-0342**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**30/03/2022**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 4**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**23/03/2022**	Sample Received Date	**25/03/2022**
Test Started Date	**25/03/2022**	Test Completion Date	**29/03/2022**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID. No.	**22/03/L-0342**		

TEST RESULTS:

DISCIPLINE : Chemical Testing			**NAME OF GROUP: Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		PHYSIO-CHEMICAL PARAMETERS		
1.	pH @ 25 ° C	IS 3025(Part 11)1983	--	7.63
2.	Conductivity	IS 3025(Part 14)1984	(µS/cm)	16220
3.	Total Dissolved Solids	(APHA 23rd Ed.,2017,2540- C)	mg/L	10862
		GENERAL CHEMICAL PARAMETERS		
1.	Chloride as Cl^-	(APHA 23rd Ed.,2017,4500-Cl)	mg/L	4495.1
2.	Carbonate as CaCO3	IS 3025(Part 51)2001	mg/L	29.6
3.	Bicarbonate as CaCO3	IS 3025(Part 51)2001	mg/L	184.5
4.	Total Alkalinity	[IS 3025(Part 23)1986, Amd.2]	mg/L	435.6
5.	Calcium as Ca	(APHA 23rd Ed.,2017,3500 Ca.B)	mg/L	388.5
6.	Magnesium as Mg	(APHA 23rd Ed.,2017,, 3500 Mg.B)	mg/L	204.5
7.	Sodium as Na	APHA 23rd Ed.,2017,3500 Na,B	mg/L	1590
8.	Potassium as K	APHA 23rd Ed.,2017,3500 K,B	mg/L	89.5
9.	Sulphate as SO4-2	IS 3025(Part 24)1986	mg/L	725.3
10.	Nitrate as NO3	(APHA 23rd Ed.,2017,4500 NO3-B)	mg/L	28.5
11.	Phosphate as PO_4	(APHA 23rd Ed.,2017,4500-P,D)	mg/L	2.5
12.	Fluoride as F	(APHA 23rd Ed.,2017,4500 F,D)	mg/L	2.9
DISCIPLINE : Chemical Testing			**NAME OF GROUP: Residues and Contaminants in Water**	
13	Mercury as Hg	(APHA 23rd Ed.,2017,3112-B)	mg/L	BDL(MDL:0.001)
14	Arsenic as As	APHA 23rd Ed.,2017,3114-C	mg/L	BDL(MDL:0.01)
15	Lead as Pb	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.01)
16	Chromium as Cr	APHA 23rd Ed.,2017,3125	mg/L	BDL(MDL:0.05)
17	Cadmium as Cd	IS 3025(Part 41)1992, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.003)
18	Iron (as Fe)	IS 3025(Part 53)2003, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.1)
19	Zinc (as Zn)	IS 3025(Part 49)1994, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)
20	Cobalt as Co	APHA 23rdEd.2017-3500-Co	mg/L	BDL(MDL:0.1)
21	Copper as Cu	IS 3025(Part 42)1992amd.01, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)

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TEST REPORT

ULR No.	--	Report No.	**URC /22/03/L-0342**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**30/03/2022**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 4**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**23/03/2022**	Sample Received Date	**25/03/2022**
Test Started Date	**25/03/2022**	Test Completion Date	**29/03/2022**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID. No.	**22/03/L-0342**		

TEST RESULTS:

DISCIPLINE: Chemical Testing			**NAME OF GROUP: Residues and Contaminants in Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		GENERAL CHEMICAL PARAMETERS		
22.	Manganese as Mn	APHA 23rd Ed.,2017,3500 Mn B	mg/L	BDL(MDL:0.1)
23.	Nickel as Ni	IS 3025(Part 54)2003, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.02)
Remarks: BDL= Below Detection Limit, **MDL** = Minimum Detection Limit,				
Opinion & Interpretation (If required): --				

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

Checked By:
Nilesh C. Patel
(Sr. Chemist)
Page No.: 2 of 2

Authorized By:
Nitin B. Tandel
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UERL/CHM/F-2/05

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TEST REPORT

ULR No.	--	Report No.	**URC /22/03/L-0342**
Name & Address of Customer	**M/s. Adani Power (Mundra) Ltd.** Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	**30/03/2022**
		Customer's Ref.	--
Sample Details	**Bore well Water Sample - 4**	Location	--
Sample Qty.	**2 Lit**	Appearance	**Colourless**
Sampling Date	**23/03/2022**	Sample Received Date	**25/03/2022**
Test Started Date	**25/03/2022**	Test Completion Date	**29/03/2022**
Sampled By	**UniStar Env. & Research Labs**	Sampling Method	**UREL/CHM/SOP/116**
UERL Lab ID. No.	**22/03/L-0342**		

TEST RESULTS:

DISCIPLINE : Chemical Testing			**NAME OF GROUP: Water**	
Sr. No.	**Parameters**	**Test Method Permissible**	**Unit of Measurement**	**Results**
		GENERAL CHEMICAL PARAMETERS		
1.	Salinity	By Calculation	ppt	8.12
DISCIPLINE: Chemical Testing			**NAME OF GROUP: Residues and Contaminants in Water**	
2.	Barium as Ba	AAS Method	mg/L	N.D.
Remarks: N.D. = Not Detectable,				
Opinion & Interpretation (If required): --				

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

Checked By:
Nilesh C. Patel
(Sr. Chemist)
Page No.: 1 of 1

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Expenditure for Environmental Protection & CER		
		(Fig. in Rs. Lacs)
Sr. No.	**Particular**	**Expenditure from Oct'21 to Mar'22**
1	Rural Development/CER/CSR Activities	1087.36
2	Green belt development	69.94
3	Legal, Consent Fee, GPCB lab bills, NABL fee	2.98
4	Hazardous waste disposal/Bio Medical disposal cost	4.10
5	Treatment and Disposal cost (Wastewater & Sewage Treatment)	34.15
6	Maintenance cost of ESP & FGD (Material Cost)	168.27
7	Online Environment Monitoring cost a. CEMS and EQMS data transferring to GPCB and CPCB b. Annual Maintaining cost for CAAQMS (03 Nos.) & EQMS system	24.70
8	Third party Environment Monitoring & Inhouse monitoring including laboratory consumable items, chemical and spares of monitoring equipment. Calibration and maintenance of Environment monitoring equipment	28.43
9	Insurance, training, and external environmental management	0.11
	Total	**1420.04**

Annexure - X

2021-22

Annual Report

CSR Kutch

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

adani Foundation

Our journey

Corporate Social Responsibility in India is going through an accelerating phase where the need for community centered impact is increasingly becoming more crucial than ever before. It is not just about the compliance with the laws and regulations but also about transitioning beyond the mandated CSR, Stakeholder engagement is a critical tool to ensure a comprehensive approach in carrying out responsible business and within that community ownership holds an important place.

Mundra is now Industrial and employment hub. Tremendous development is expected in upcoming years. In Year 2021-22, **Uthhan Project expanded its wings from 17 Primary schools to 35 Primary schools** with **MOU with Education Department**. Sustainable Agriculture Initiatives i.e. Natural Farming, Home biogas, Drip Irrigation, Vermi compost, Tissue Culture and Various type of fodder growing are started as a mission with Capacity Building with **5500+ Farmers and 3500+ cattle owners**. Mangroves costal biodiversity, water harvesting structures and Home Biogas promotion is ongoing sustainable project with proper documentation and demarcation. Adani Vidya Mandir has proven best in education by reaching to its apex level of Quality Education through digital technology. It is nurturing fisher folk community students by enabling them access to Tablets to prepare them techno-savy.

Under the guidance of leadership team, Community Resource Centre is developed as a systematic model for empowering rural community with an aim to bridge the gap between underprivileged community who need support and government schemes. Adani Foundation firmly believes to carry all its project by involving community in its operations. The involvement of Fisherman community and women provides real-time feedback and leads to successful projects.

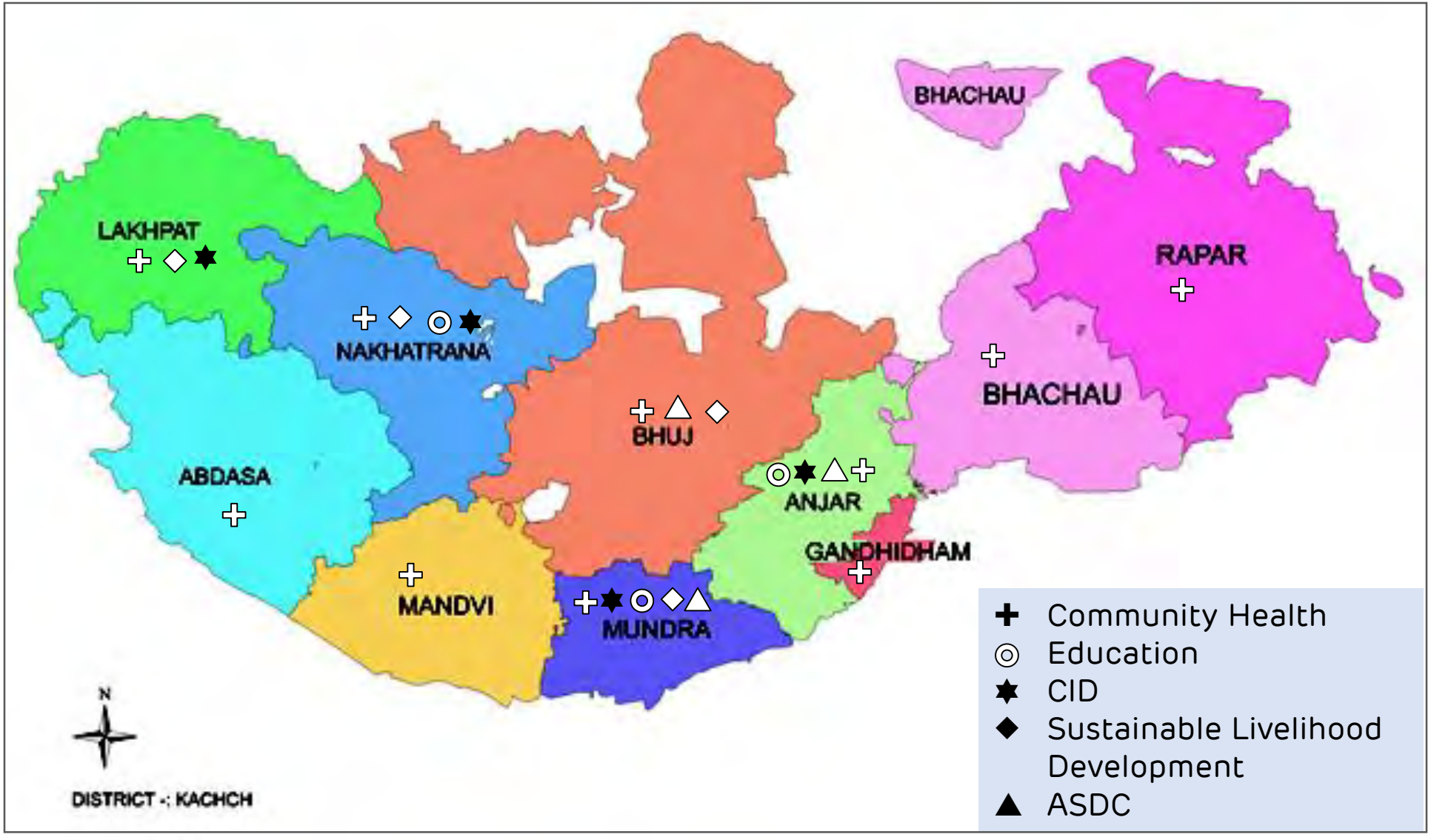
'Technical Training Program' by Adani Skill Development Centre for Fisher Folk community youth is a flagship program to provide them with a platform to get skilled and carve their future into new career options. The ASDC is committed to the cause of the deprived and underprivileged to generate employment through enhancing skills. It has been working relentlessly which resulted in rapport building with District Administration Kutch also.

Respected Shri Dr. Priti G. Adani, Chair Person, Adani Foundation with her charismatic leadership has transformed millions of lives through sustainable development initiatives. Along with her, Rakshit Shah, Executive Director, APSEZ has been a great mentor and involves himself thoroughly in all development initiatives. Mundra team would also like to acknowledge Shri Vasant Gadhvi, Executive Director, Adani Foundation for cultivating great ideas and guidance to the team. We are also grateful to Respected Gowda Sir (COO, AF) for being a source of motivation.

AF Mundra team acknowledges CEO - APSEZ, Human Resource Department- APSEZ, Finance Department-APSE for continuous support and facilitation.

Towards Growth with Goodness, Adani Foundation presents highlights of FY 2021 in this Annual Report!

Our Presence in Kutch



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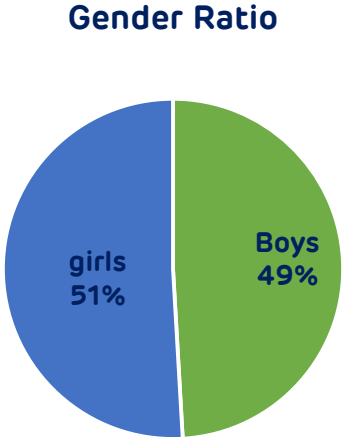
Education (SDG - 4/4.a)

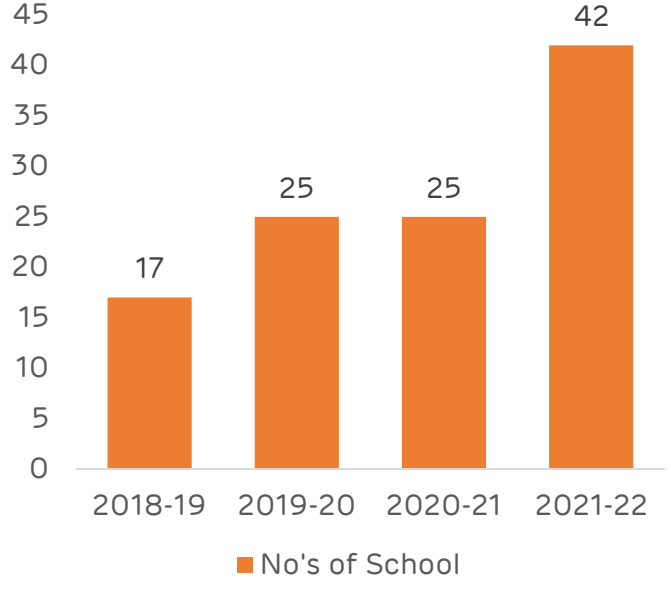
Education Projects

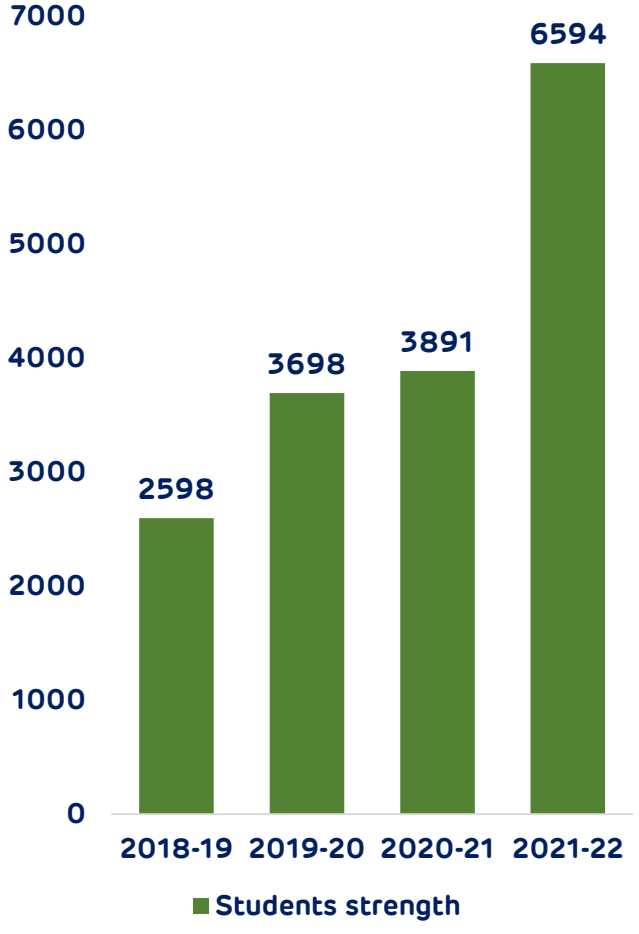
To foster students' learning abilities and achieve better learning outcomes at the grassroots, Adani Foundation charted an innovative intervention in Year 2018-19 through Project Utthan.

This comprehensive intervention entails:

- ✓ Adopting government primary schools
- ✓ Tutoring Priya Vidyarthi's (progressive learners)
- ✓ Arresting dropout rates
- ✓ Collaborating for teachers' capacity building
- ✓ Creating joyful learning spaces







Annual Achievement

- Introducing English as a third language.

Though talent has no barriers to success yet often rural community children and youth are devoid of higher education and better job opportunities only because of lack of command over English language. However, getting equipped with International language expands horizon of a student by opening wide communication mediums for them to learn and grow.

In Gujarat, The language gets introduced from Class4 whereas under the Project Utthan, Adani Foundation initiated to provide basics of English from class 1 with a structured syllabus. Utthan assisted 3,246 students to learn English from Class 1.

Table shows the result of Gunotsav of year 2021-22 for 18 Schools (24 Schools Results are awaited)

Gunotsav Result					
Academic year	Numbers of school in grade				
	A+	A	B	C	D
2020-21	1	0	30	11	0
2021-22	2	8	7	1	0

Utthan assisted

3246

students to learn English from Class 1

Class		Students are able for....
I	62 %	✓ Standing line, sleeping line, Left Slanting line, Right Slanting line, Left Curve, Right Curve, Up Curve, Down Curve ✓ Writing capital letter of A to Z, Identification of alphabet, Match alphabet with object
II	64 %	✓ Writing capital and small letters ✓ Vowel and consonant ✓ Week, month, and numbers up to 30
III	73 %	✓ Differentiate between capital and small letters ✓ Recite rhymes ✓ Numbers 1-50, English name of shapes, fruit, vegetable, and stationary items ✓ Action words: Sit down, stand up, Run, Walk, Jump
IV	76 %	✓ Capital and small letters ✓ Body parts, Golden words ✓ Self-introduction in 5-7 sentences

IT ON WHEELS
Benefited 3418 students

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. This impede their development.

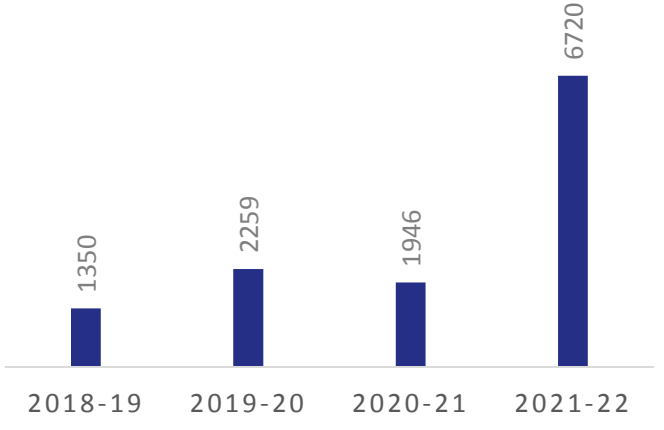
IT on wheel program is run to teach them Basic emphasizes elementary school digital literacy.

Highlights

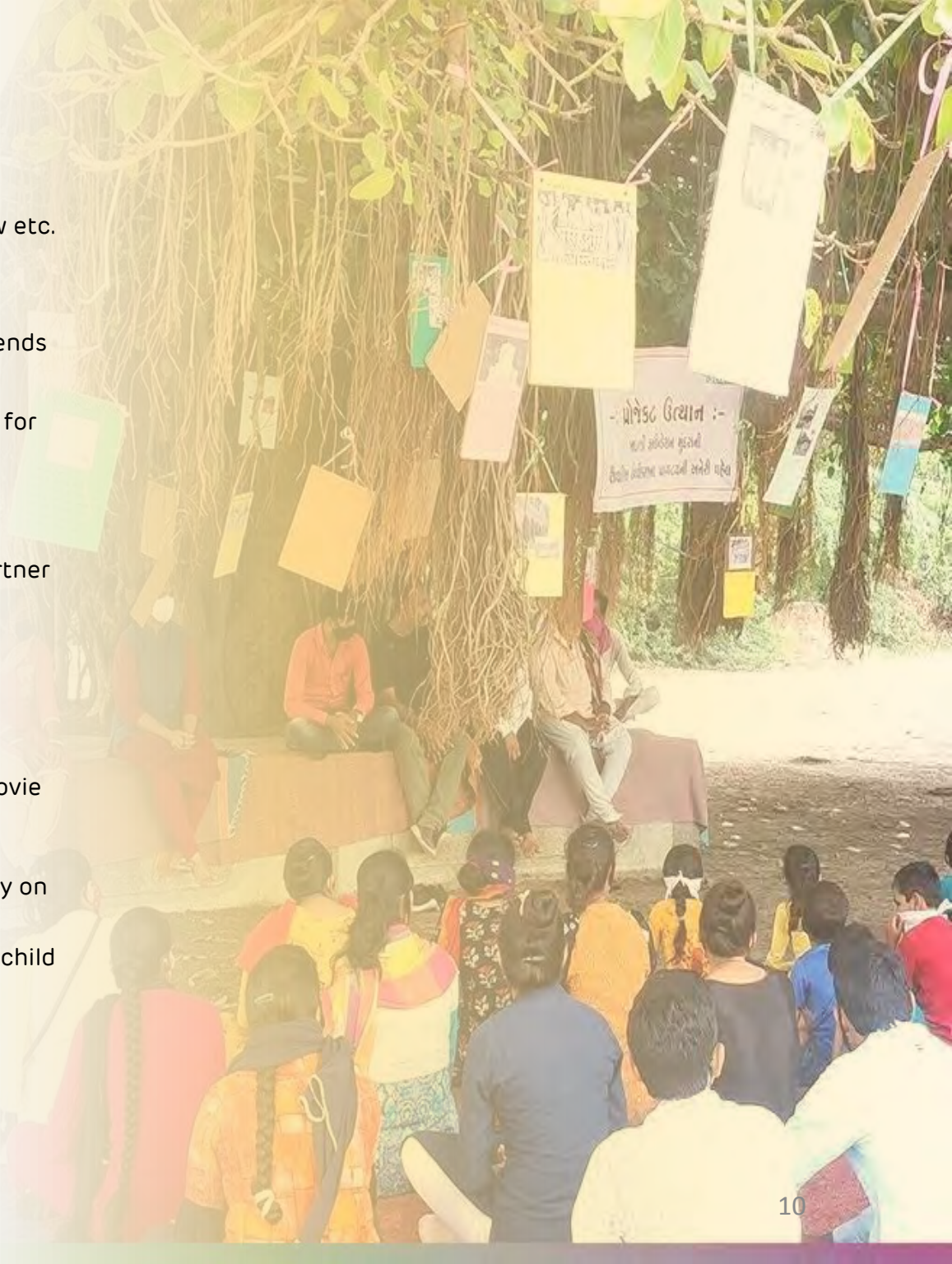
- ✓ 40 laptops + 2 IT instructor + 01 Van with customize basic syllabus
- ✓ Catering students from classes: 4-8
- ✓ IT on Wheel visits fortnightly to each school under project Utthan.

Annual Mother's meet

A child's maximum growth occurs in initial years of education where involvement of teacher as well as mother plays a key role in nurturing their character and personality. Many of the students are first generation learners with uneducated parents, in such case, Mother's meet helps mother and teacher are both in sync towards child's education. Moreover, mothers feel empowered and valued and gets insight of the school activities regularly.



Celebration/competition	Activities performed
World Book Day	▪ Virtual Group Reading, Puppetry Show etc.
Mother's Day	▪ Letter to supermom
International Yoga Day	▪ Performing Yoga Virtually + Physically
World emoji day	▪ Preparing emoji + exchanging with friends
Azadi ka Amrut Mahotsav	▪ Poster making competition
Rashtra Gaan	▪ Certificate from Ministry of Education for 'Recitation of Rashtragaan'.
Raksha Bandhan	▪ Eco Friendly Rakhi for Corona warriors
Teachers' day	▪ Gratitude wall for teachers
ISLM Participation	▪ Digital bookmark exchange with 11 partner schools from 5 countries
Virtual connection around the World	▪ Live connected with partner school of Croatia
Children's Day	▪ Paint party
World computer literacy day	▪ Restart of 'IT on Wheel'
National Maths Day	▪ Match Competition & Documentary movie on Shri Ramanujan.
National Youth Day	▪ Character sketch, Speech on Swamiji, Quote Competition ,Short documentary on Swamiji.
National Girl Child Day	▪ Contribution of Savitribai Phule in girl child education
National Science Day	▪ Girl/Women noble laurels in science , Model making ▪ Documentary on Raman effect
International Women's Day	▪ Women's Day with 1000 Mothers



Healthy competition inspires kids to exhibit their maximum potential. When students compete, they will become more inquisitive, research independently and learn to work with others. They will strive to do more than is required. These abilities prepare children for future situations of all kinds. Due to pandemic students were away from multiple competitions and celebrations were planned in school. Which helps them for-

- Improving teamwork and collaboration
- Enhancing social and emotional learning
- Increasing intrinsic motivation
- Facilitating growth mind-set
- Building mental toughness
- Virtual celebrations and competitions to engage students during lockdown period.


Government of Gujarat

Certificate of Completion

This is to certify that

Devalbai vachhiya shakhra

has successfully completed the course

કચ્છી ભાષા ઓનલાઈન કોર્સ

on 05 March 2022

Director, GCERT

Course Director, Principal, DIET Bhuj

Scan to Verify Certificate

Capacity Building Program

To make the project sustainable, Utthan closely **works with block resource coordinators to organize monthly training sessions for Government teachers + Utthan sahayaks on various subjects.** Entire academic year teachers training is focused on National Education Policy 2020.

Utthan's outreach strategies to support children's learning

- 100 hours capacity building programs for Utthan sahayaks and school Teachers
- 90% students were involved in various activities under Aazadi ka Amrit Mahotsav
- 6600 hours were given in 'SAMAYDAAN'
- 100 % participation in 100 days reading campaign
- Project is in alignment with NIPUN Bharat: FLN
- Dedicatedly 80 hours provided for preparing JNV and NMMS examination. 19 number of students qualified for JNV and NMMS.

100% Utthan Schools are equipped with:

- ✓ Smart classrooms
- ✓ LED TV
- ✓ Library cupboard with 350 books
- ✓ Annual subscription of 07 magazines
- ✓ Sports materials
- ✓ Music instruments
- ✓ BALA Painting
- ✓ TLMs focusing language and numeracy
- ✓ Kitchen garden – 4200 plants planted

Reaching out to students with no smartphones at home

24,748 Voice messages sent to create awareness regarding Precautions during Covid19

All students taught during sheri shikshan by Utthan sahayaks

74% progressive learners virtually connected on various platform

Adani Vidya Mandir, Bhadreshwar (SDG - 4/4.1)

EDUCATION: FREE AND COMPULSORY – WHAT A WAY TO LEARN LOGIC!" The quote mentioned unfolds the distinguished 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. Due to Covid Pandemic this year Class 1st Admission was done.

AVMB –Adani Vidhya Mandir, Bhadreswar is accredited By NABET under 'Quality Council of India'

SDG

- ✓ ***Quality education - 4***
- ✓ ***GenderEquality - 5***
- ✓ ***Reduced Inequality - 10***

National Accreditation Board for Education and Training is a constituent Board of Quality Council of India.

NABET is offering accreditation program for Quality School Governance in the Country, with a view to provide framework for the effective management and delivery of the holistic education program aimed at overall development of students.

State level First Gujarati Medium school accredited by NABET

Adani Vidya Mandir Bhadreshwar Gujarat Board Standard 10th Examination Result is 82.60% (19 students have passed the examination out of 23). Adani Foundation took complete responsibility of further study of students with respect to their interest.

The global upsurge of the Covid-19 pandemic and the resultant lockdown has brought all of us to face such unprecedented times and situations. The challenge was rural locality, network unavailability, lack of health awareness, apprehensions for technology and gadgets and financial crunch to spend on mobile / Internet.

But We did not Give-up and reached out to our students to pursuit educational through virtual platform by various initiative.

Objective

- Provide free and Quality Education to economically and socially under-privileged students
- Support to students for academics and co-curricular activities and overall well-being

Project Activity

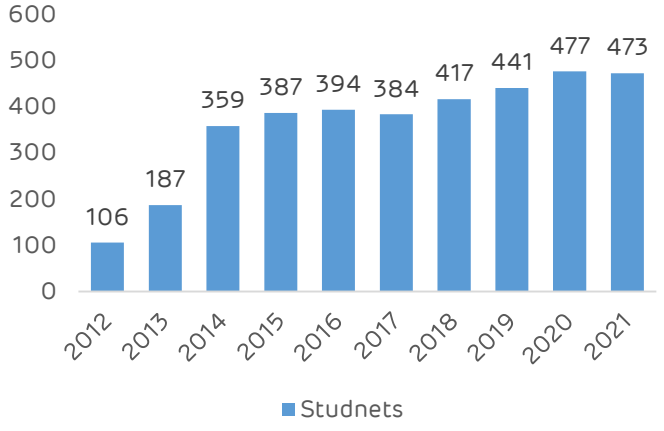
- Balwadis started in 2010, for students in age group of 2-5 yrs. In 2013, this school was built on a donated land
- Cost Free food, education, uniforms, online tablets
- Classes from Gr-I to Gr-X with 22 qualified teachers and 8 helping staffs
- Monthly stay of Gr-X students at school before exam, along with teachers

Outcome

- **473 underprivileged students** of Fisherman & Maldhari communities from **8 villages** taking education at the school
- Educated children have better opportunities of income beyond fishing
- Quality of life and change of mindset of students & families
- With education, many addictions reduced

AVMB STD - 10 SE BATCH RESULT
Year 2021-2022

SR NO	GRADE	STUDENTS
1	Above 80 %	01
2	Above 70 %	00
3	Above 60 %	07
4	Above 50 %	07
5	Above 35 %	12
	TOTAL	27

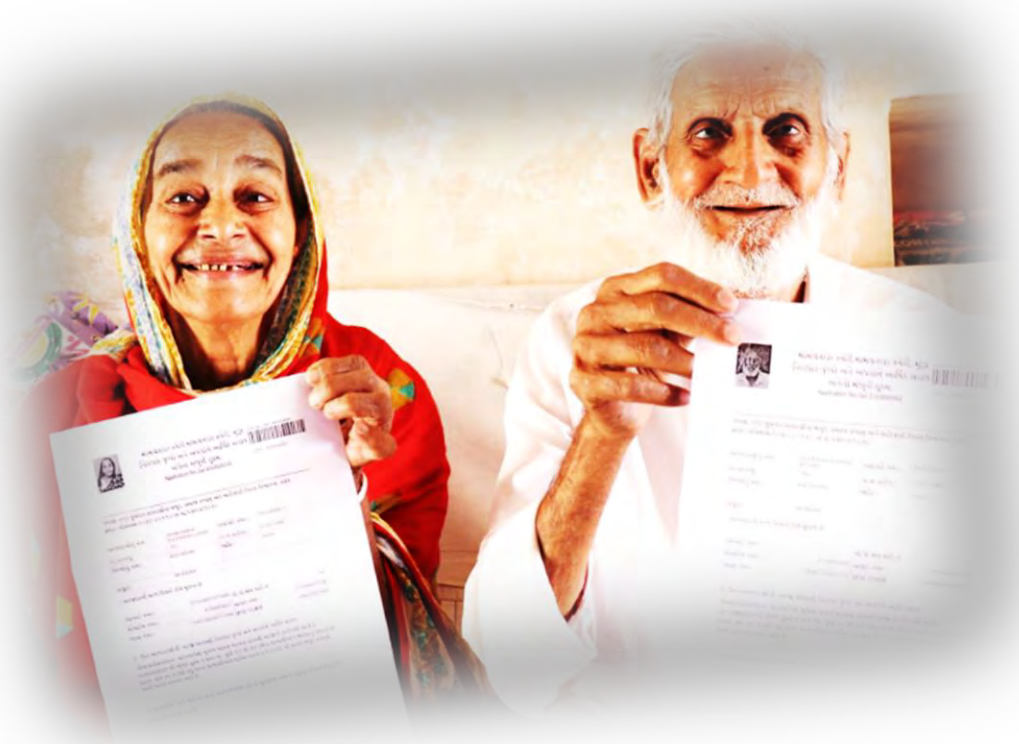


- Street Education popularly known as ‘Sheri Shikshan’ was initiated for the students who could not attend sessions online.
- Offline education was started for Class 10 students under the Covid19 Guidelines.
- ‘Fit India week’ celebrated by arranging various sports events, Elocution, Written and Drawing competition for class 9 and 10 students.
- Covid Vaccination drive for Class 10 students in coordination with GKGH, Bhuj Hospital.
- Various National and International day celebrations at School level with learn and fun activities as well as conducted Motivation Sessions.
- Motivating Girl Child from fisherfolk families for Education after 10th Standard.

Community Health Projects

Good Health is extremely important, invaluable and indispensable. A Healthy body paves the way for a healthy mind. Adani Foundation team at Kutch works towards better health of community and access to easy consultation with expert doctors in collaboration with G.K General Hospital, Bhuj and Adani Hospital, Mundra. For more than a decade, Community care is provided through Mobile Health Care Units, Rural Clinics and Health Cards for senior citizens.

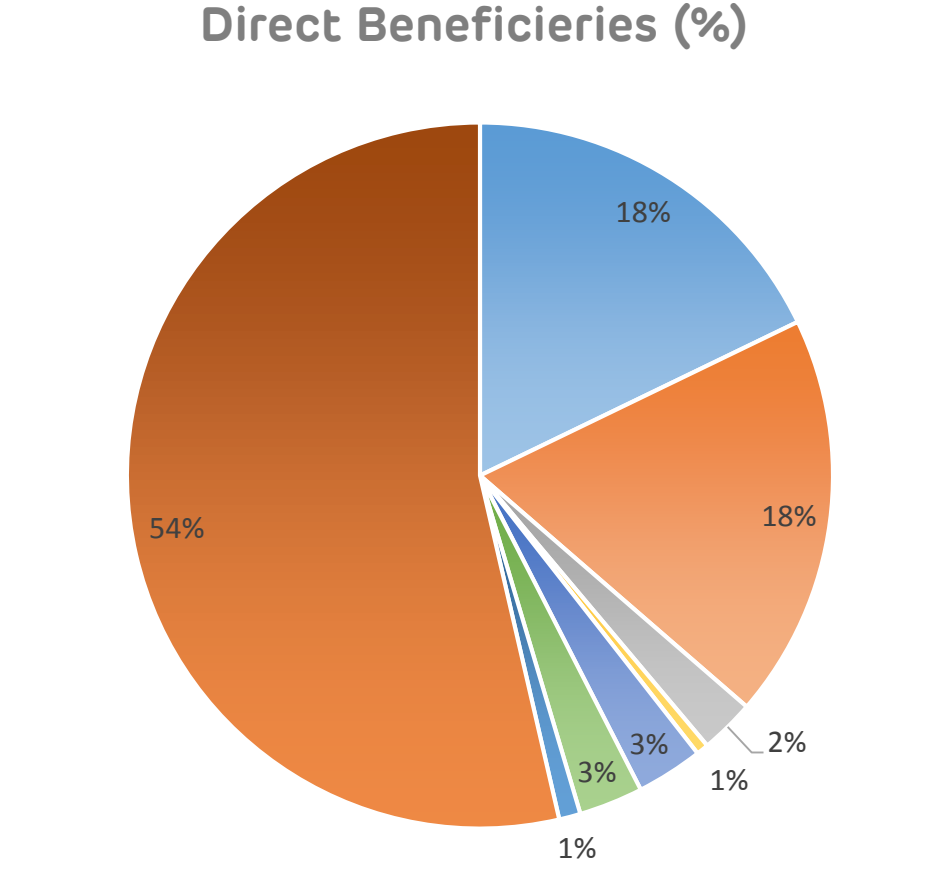
In span of 6 years, there are number of cases reported for Kidney related diseases. Under those circumstances, periodic and special health camps are scheduled to address this issue, provide them necessary treatment support. We also conduct awareness camps for preventive measures against kidney problems.



It is health that is real Wealth , not a piece of Gold and silver.

Preventive and curative healthcare are critical to sustaining community health and promoting economic prosperity. The objective is to find the proper balance that will lead to a long, healthy, and fulfilling life journey for that AF

Project	Direct Beneficiary	In-Direct Beneficiary
Medical Mobile van	10043	39844
Rural Clinic	10439	41436
Medical Supports	1409	5532
Dialysis Supports	314	30
General Health camp	1715	6852
Spe. Health camp	1655	6624
COVID-19 AHMPL	554	2770
AHMPL-OPD & IPD	31291	90573
Total	57420	193661



Rural Clinic & Mobile Health Care unit

Health is the most basic prerequisite for community development and in order to transform rural healthcare landscape Adani Foundation has initiated **'Mobile Health Care'** and **'Rural Clinic Service'** to providing primary, preventative and curative healthcare services accessible in inaccessible areas which is being executed since a decade. Adani Foundation has acted as catalyst to reduce health disparity and hardship of medical expenses among community.

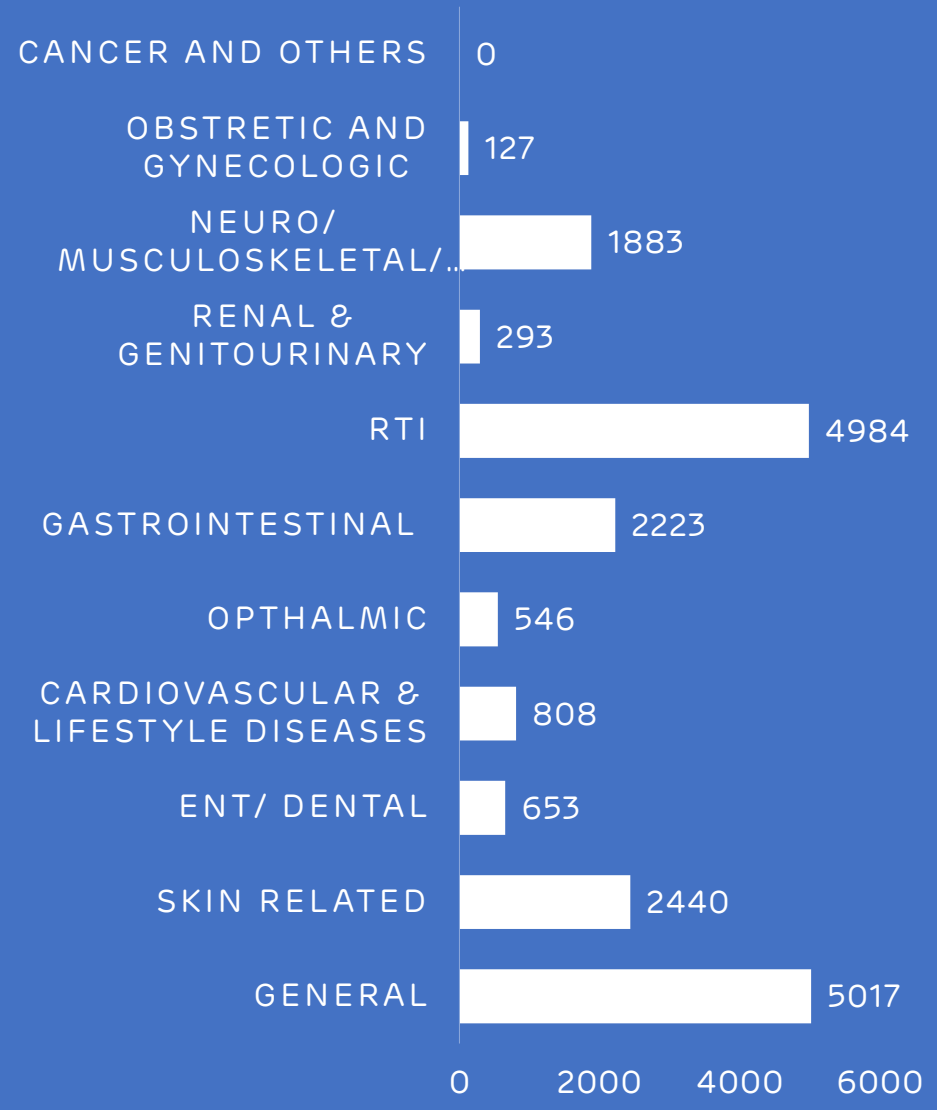
- ✓ Time saving
- ✓ Reduce Medical expenses
- ✓ diagnosis and treatment
- ✓ Preventive health screenings
- ✓ Early disease diagnosis
- ✓ Chronic disease management
- ✓ Health education & Counseling

The mobile health care unit is operated by Medical officer and health care assistant and equipped with various integrated medical devices that allows Medical staff to conduct preliminary check up. more than 90 types of general life saving medicines are available in MHCU and covered 29 villages and 07 fishermen settlements population. MHCU and Rural Clinics are providing services of Bloood pressure checking, Sugar testing and ECG as well,

Similarly rural clinics are serving at **9 Villages of Mundra 3 Villages of Anjar Block and Mandavi Block.**

The MHCU and Rural Clinics services are available with Token Charges Rs. 20 per patient.

DISEASE WISE DATA OF MHCU & RURAL CLINIC



Under the '**Preventive Health Care**' programme, specific screening and questionnaire are developed for Non communicable disease(NCD) like ***Blood pressure, Sugar, Thyroid*** and suspected patients are referred for secondary examination at Adani Hospital, Mundra.

More than **110 Patients are diagnosed with NCD and are cured before patient reaches to severity stage**.

Support to Vulnerable Patients

Adani foundation provide financial assistance to the most economically challenged patients who are suffering from life threatening diseases related to heart, liver, kidney and cancer cases with Minimum Participation.

In the current year total **1409 patients from Mundra, Mandavi and Anjar Block were supported in Adani Hospital Mundra.**

Dialysis Support

Patients with kidney disorders must undergo periodic dialysis, which is expensive and lends financial burden to family.

Adani Foundation has initiated a dialysis program to support foremost needy patients .

Till date 5 patients with critical and severe condition has been supported for dialysis with token charge of Rs. 150 per session. Regular dialysis has improved patients condition prolonging their life.

Senior Citizen Project

Adani Foundation has launched Senior citizen project with the aim to provide access for Promotive, Preventive and Curative health service to more than **8500+** elderly people of Mundra since 2011 to 2020 – A Decade.

After 2021 to make the project sustainable, Linkages with Government Schemes and senior citizens are initiated. Total **61 Senior citizens has been Facilitated with Senior Citizen and Widow Pension Scheme Rs. 1250/Month in 2021**. Till more than **750+ Senior citizens ARE Linked with Gov.schmes..**

Health camps

Getting the right health screenings and treatments is the key to living longer and better.

Major Activities

- Under Dignity of workforce program, weekly medical camps organized at labour colonies.
- General health check up of work force plus deaddiction counselling done by Medical Officers.
- Motivational sessions by "**Prajapita Brahmakumaris**" are also organized to make them strong against addiction.
- General Health camps, Specialty camps, Pediatric camp especially for Malnourished children are organized frequently to provide health care treatment to the community.

In this year **total 5200+ People are diagnosed and treated accordingly**.

Corona Related Work at GKGH and AHMPL

- Started Covid care centre service at **Samudra town ship** to Provide medical services at 24 x7 hrs. Home Visit for examining patients with severe conditions and providing them immediate relief.
- AHMPL, Mundra was converted into Covid Hospital with 100 bed Facilities with oxygen to extend treatment to Covid patients. All related coordination done by our team for more than **350+ OPDs and IPDs**.
- Provided Oxygen Concentrators to home isolated patients to safeguard their lives during pandemic.
- Provide hearses to shift Covid deceased patients to Crematorium with all dignity.
- Precautionary voice message dissemination through '*Awaj de*' voice message service **Over 11000+** Community.
- Sanitized villages, Distribution of Vitamin C tablet to **2300+people**
- Adani Foundation employees volunteered for providing service in G K General Hospital, Bhuj during pandemic.

Machhimar Ajivika Uparjan Yojana

The availability of water for personal and domestic hygiene has been found to be an important factor in decreasing the rates of water-related diseases such as ascariasis, diarrhea, schistosomiasis, and trachoma. **2091 female beneficiaries** at nine fisherfolk vasahats.

- To Reduce women drudgery to get water at fisherfolk settlement
- To Reduce Water borne disease

Sr. No	Vashat	Family	Requirement	Remarks
1	Luni	116	15000	9 Months
2	BavdiBandar	107	17500	9 Months
3	RandhBandar	245	25000	9 Month
4	KutdiBandar	118	-	Linkages with MSPVL
5	ZarapraVasahat	90	-	Linkages with Port
6	Virabandar	80	-	Linkage with GWIL
7	Junabandar	160	-	Linkage with Mundra GP
8	GhavarvaroBanada	60	-	Linkage with GWIL
9	Zaraprachacha	55	-	Linkages with Port GWIL
Total		**1031**		

Gujarat Adani Institute of Medical Science (GAIMS) - Bhuj

Adani Foundation Team has initiated coordination with GKGH hospital since 2015 and established a reception area for the smooth patient coordination.

•GKGH Hospital is Covid Care Hospital since 22nd March 2020. in the second wave of Covid Adani Foundation staff members supported in patient counselling, coordinating and supporting for dead body Covid care van.

•Total **7826** Covid patients got treatment from overall Kutch with satisfaction.

•Dead body medical van –Dignity to death is one of the noble initiatives taken up by the Adani Foundation. If any death occurs in GKGH, dead bodies are shifted to the native village of the concerned in the Kutch District free of cost. Total 1163 dead bodies privileged till now to different locations in Kutch including Covid Patients.

•Mahiti Setu, A Platform at GKGH to Guide and Assist to get Government health scheme benefit. Through Mahiti Setu 6923 beneficiaries are sourced and more than 947 beneficiaries are linked with Ayushman Yojna and MAA Yojna.

Facilitation of Government Bal sahay Yojna- Rs.50000 Financial support to **527 family** who had lost their members due to covid-19.

Patient Care and Coordination at GKGH Bhuj to avail proper treatment and Guide for 100% satisfaction.

Environment Sustainability

Environmental sustainability involves making decisions and taking actions that are in the interests of protecting the natural world, with particular emphasis on preserving the capability of the environment to support human life. It is an important topic at the present time, as people are realizing the full impact that businesses and individuals can have on the environment.

Sustainable development has many important facets/components like social, economic, environmental, etc. these components are closely interrelated and mutually re-enforcing. Under Corporate Environmental responsibility 10 km radius villages from SEZ Boundaries.

To make connections between human actions and the level of biological diversity found within a habitat and/or ecosystem, In year 2017-18 project "Sanrakshan" was launched in coordination with GUIDE. MOU has been signed with Dr. Vijay Kumar – GUIDE for conservation of five spices of mangroves.

Miyawaki–Nana Kapaya

Miyawaki is a technique pioneered by Japanese botanist Akira Miyawaki, that helps build dense, native forests. The Miyawaki method of reconstitution of "indigenous forests by indigenous trees" produces a rich, dense and efficient protective pioneer forest in 20 to 30 years. The approach is supposed to ensure that plant growth is 10times faster and the resulting plantation is 30 times denser than usual. It involves planting dozens of native species in the same area, and becomes maintenance-free after the first three years.

Nana Kapaya village and proposed site for Miyawaki-Dense Plantation is very close to many industries in and around the Mundra landscape. This area is also very close to main roads and coastal creeks. Mainly dense to sparse Prosopis Juliflora- (Ganda Bavar cover) is recorded surrounding to project site with very few scattered native trees like-Limda, Deshi Bavaretc. Shrubs species like-Akadoand Aavarare also predominant close to site; while, grasses like
Chhabarand Dhrabare recorded in proposed plot area.

As shared and discussed by villagers, this proposed plot is also very close to sewage water tank and nallahs; and proposing for watering to our proposed plantation.
As discussed with villagers and Adani Foundation, we proposed the close or dense plantation at site-called 1Miyawaki Types of Plantations with following four major compartments (45X20 meters approx.) and with following strategies:

1.Mixed Plantation dominant Drought Resistant Plants
2.Mixed Plantation dominant by Larger Leaves
3.Mixed Plantation dominant by Saline Resistant Plants
4.Mixed Plantation dominant by Medicinal Values.
Plantation of 4965 saplings of different 42 spices is completed which will result in dense forest within 2 years

Smriti van

Smriti van Memorial park is a unique initiative by Prime Minister in order to commemorate the death of about 13,805 people during this massive earthquake which had its epicenter in Bhuj District.
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.
As a part of this Smritivan Memorial Park, it will have a museum, convention Centre, sunset point and Ecological park with around varied species of trees to attract different biodiversity.
For the ecological park, approx. 24 acres of land has been demarcated, wherein it is proposed to plant ~3 lakh local species trees.

Under Phase –1 project, Govt of Gujarat through GSDMA will be planting across 1 lakh trees, across 8 acres through "Miyawaki" methodology(Japanese technology of tree plantation). They have already enrolled the services of M/s Forest Creator, a Mumbai, based agency expertise in carrying out afforestation project, through Miyawaki technology.

Forest Creators have already been involved and completed 58such kind of project of Terrestrial afforestation, across India and this will be their 59thproject. (Details of project carried out Forest Creator attached)
Under this project, 60+ local species of trees will be planted and further the entire scope of development of Nursery, Soil enrichment, Plantation of saplings, mulching, biomass application, water supply & maintenance for 3 years are considered .
All Corporate of Kutch has supported fund for the same. APSEZ has done monitory support under CSR and Adani Foundation is coordinating for monitoring

Coastal Bio diversity

Mangrove is a tropical tree or shrub that grows in swampy areas and has tangled roots located above ground. Mangroves, seagrass beds, and coral reefs work as a single system that keeps coastal zones healthy and provide essential habitat for thousands of Flora and Fauna.

Mangrove cover in India is 4992 km2 which is around 3% of global distribution and 0.15% of the country's total geographical area. With the second-largest mangrove cover in India, mangroves cover in Kutch increased from 794.77 km2 to 798.44 km2 *With dominant species of Avicennia marina, Rhizophora, Ceriops, Aegiceros* For the past two decades and APSEZ, Mundra is actively involved in mangrove conservation and management activities.

Adani Foundation contemplated to establishment of multi-species Mangrove Biodiversity Park to help disseminate knowledge on the mangrove ecosystem and simultaneously conserve the species with collaboration of Gujarat Institute of Desert Ecology (GUIDE), Bhuj, Kachchh.

Total 12 hector area have been developed with multi-species Mangrove plantation of ***Avicenna Marina ,Rhizophora Mucronata ,Ceriops Tagal ,Ceropos decandra at Luni Coast as phase wise in*** the year 2018-2019 (Phase-I). & Phase-II (2019-2020) with good survival rate.

So, to develop that as Bio- diversity park ,another 03 ha area coastal stretches have been planted with selected true mangrove species.

Fisheries Diversity

Mudskippers and bivalves were found near the waterfront. The gastropod, *Pirenella cingulata* few crabs ,Dead razor clams were also found inside the plantation site, A few crablets of *Scylla serrata* species and mud-skippers (*Periophthalmus waltoni*) were found in the cultivation site. In addition, catfish and mullets also occurred at the intertidal zone that the fisherman collected.



Macro Fauna

- *Gelasimus tetragonon*
- *Austruca variegata*
- *Periophthalmus waltoni*
- *Tubuca dussumieri*
- *Calidris pugnax Ardea cinerea*
- *Recurvirostra avosetta*
- *Larus fuscus*
- *Pirenella cingulata*
- *Solen sp.*
- *Painted strock*

- ✓ reduce carbon sequestration by 3 T per hector annually in early five years - after it reduces up to 20-25 T per hector
- ✓ provide alternate livelihood to fisherman by providing 3500 person days employment annually .
- ✓ Provide natural Habitat for Flora and Fauna.

Water Conservation (SDG 6/6.6)

At the turn of millennium, the state watched with growing alarm the steady depletion of its ground water and launched massive drive to achieve water security in Mundra region.

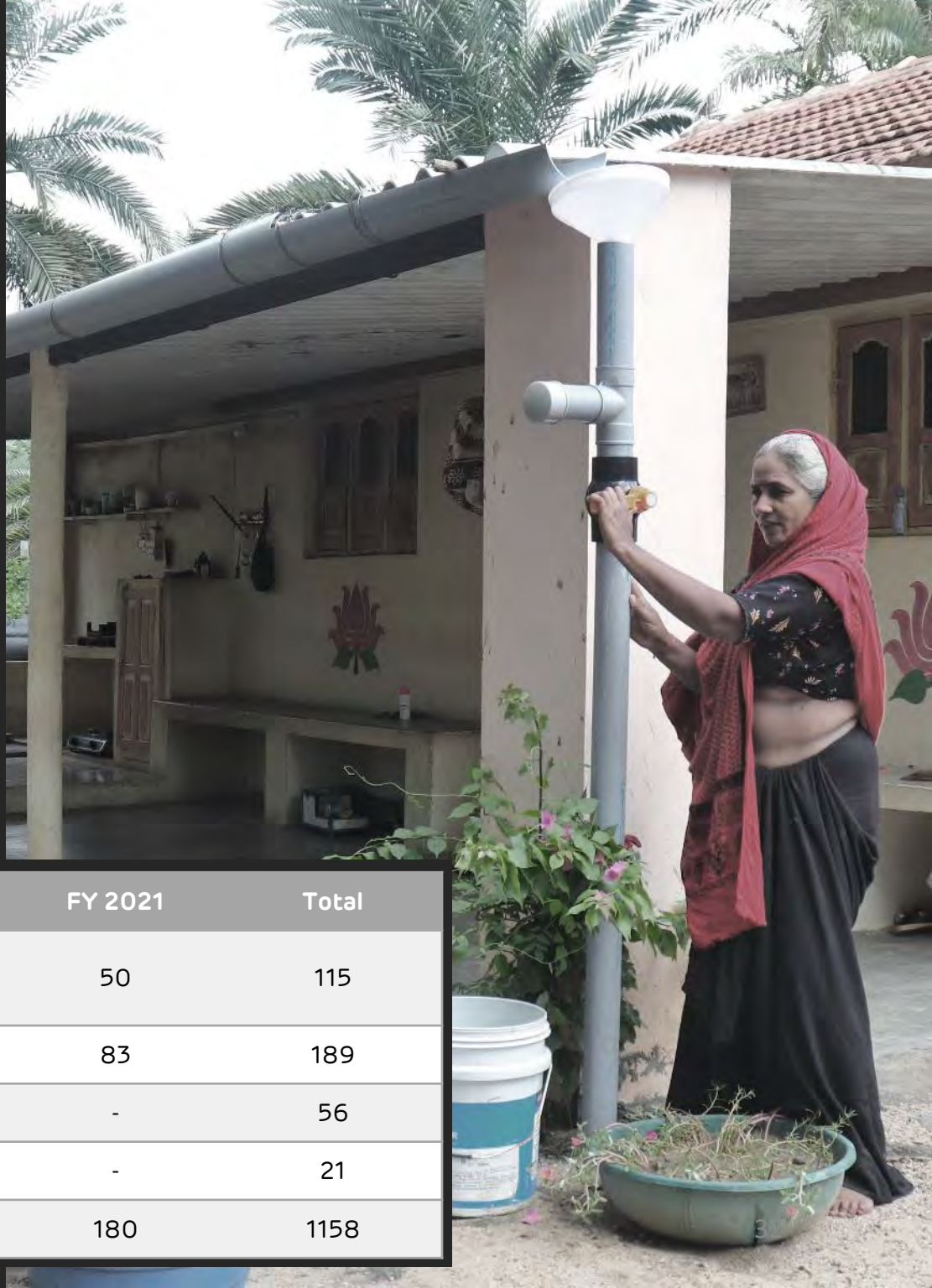
As a part of pre monsoon activities due to negligible rainfall we are getting less outcome of this intervention.

The Foundation's Water Conservation program, Swajal, is aimed at addressing the alarming depletion of groundwater levels and reduction in water sources in various parts of the country. Devising eco-friendly and cost-efficient methods of water body rejuvenation, the project works to revive existing water resources, plan sustainable infrastructure for protection of natural water bodies and improve ecological conditions around the area. Interventions are focused on groundwater recharge, sustainable agriculture and boosting livelihoods post stream rejuvenation.

Total 110 Roof Top Rain Water Harvesting, 190 Recharge Borewell and 56 Pond Deepening carried out in up to year.

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 hectors.
- ✓ 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.



Initiative	FY 2021	Total
Roof Top Rain Water Harvesting	50	115
Bore & well recharge	83	189
Pond Deepening	-	56
Check dams	-	21
Drip Irrigation	180	1158

Drip Irrigation Project (SDG 2/2.4)

The fragile economy of Kutch is hampered by the salinity ingress and higher saline ground water which consequently impact on cultivation area and farmers yields as well.

Hence, To Conserve the Water. It is necessary to bring the land under **'Micro Irrigation System'** by allowing water to drip slowly to the roots of the plants, either from above the soil surface or buried below the surface we have started project Drip irrigation to Provide Financial support to adopt & Install Drip irrigation system.

This year **More than 180** farmers are supported with 15% Amount of Total Cost for maximum Rs.0.40lac.

Till the date Total **2229 acre of land are covered under Drip system by 1158 farmers** impacted to save their Money ,time and water and electricity as well.

The process to availing Benefits

- Farmers have to apply in the prescribed form of Adani foundation with photographs _
- Inspection and verification will be by AF representative.
- Ration card, work order of GGRC, 7/12 certificate, and all bills must be attached.
- Solutions to Queries .
- Primary information about farmer land will be recorded.
- Farm visit within 10 days of receipt of application and verified installation of the system as per map and material.
- Feedback from farmers.

Farmers selection Criteria

- Farmer should belong to the intervention villages of AF (Adhar Card) within Mundra block
- Small/marginal farmer – having maximum 3 hectors total family land were considered
- Submit copy of application and copy of approval certificate from GGRC for drip irrigation
- Consent to contribute and participate as per the provision of the AF scheme
- Spot check/ field visit at the farmer's farmland by AF team before and after setting up the drip irrigation system and regular monitoring visit.
- Opening a bank account (the financial assistance was provided only through cheque)

Grassland Ecosystem Restoration project - Guneri

Lakhpat taluka is bestowed with rich mineral resources, lignite being the most important. Additionally, the area is also known for presence of tropical thorn forest. The region exhibits a great correlation between floral and faunal species and many rare and threatened species including Helichrysum cutchicum (endemic species), Cistanche tubulosa, Campylanthus ramoissimus, and Sida tiagii hence area is a proposed Biodiversity Heritage Site. However, the stress on this biological pool is constant, which arises primarily due to dynamic environmental conditions culminating in frequent droughts.

- With this background, and as a part of Biodiversity initiatives, to conceptualizing the landscape ecology and social-ecological systems together, by taking grassland restoration as its epicenter, APSEZ has proposed to take the pioneering steps towards building sustainable growth in the Lakhpat region, Kutch by taking **the initiation of restoring the natural grassland habitats (Ecological Restoration) along the Guneri village, i.e. ~40 Ha grassland ecosystem in gauchar land**, by collaboration with Gujarat Ecology Society (GES) – A Nonprofit Organization, based in Vadodara, Gujarat.

Grassland Ecosystem Restoration project - Guneri

Guneri village is situated north of Lakhpat fort with a population of 967 as per the 2011census. A Biodiversity Management Committee (BMC)already exists there and hence it becomes easy to undertake grassland restoration with the help of committee members. The gauchar land available for restoration is around 100 Ha and about 40 Ha of the area can be considered for restoration. The restoration process will be spread over a time period of three years, starting initially with 10 Ha and slowly moving up to 40 Ha by the third year.

The faunal survey was initiated in the month of December and continued till February 2022. This time is suitable to record the migratory birds. The survey highlights the presence of 9 threatened species based on IUCN (2021) viz., Monitor Lizard Black tailed Godwit, Black-headed Ibis, Common Pochard, Tawny Eagle, Steppe Eagle and White-backed Vulture were sighted in the area.

MILESTONES ACHIEVED

- Restoring the grasslands in the Gauchar lands
- Preparatory phase for plantation activity
- Capacity building of the locals in the ecological monitoring process and process of documentation and observation of changes
- faunal Survey Mambles-07 species ,Reptiles-04 Species Birds-59 Species ,Threatened species-09 Species were Found.
- On Soil day celebration, An expert session was presented by Dr. Jayendra Lakhmapurkar for the APSEZ staff, students and farmers.
- International Wetland day was celebrated on 2nd February jointly by Adani port and logistics and GES with the theme "**Action on wetlands for people and nature'** . Key note speaker Dr. Deepa Gavali took insightful session to create awareness.

Sustainable Livelihood Projects

Empowering lives and broadening their scope for economic opportunities, Adani Foundation's initiatives introduced under 'Sustainable Livelihood Development Program', is formed to empower and uplift community towards better living and better livelihood.

At Mundra Taluka, several communities are economically side-lined and depend on a sole income source or are unemployed.

Sustainable livelihood projects have been launched to cater financial independence through building local partnerships, providing diverse livelihood avenues, inculcate the attitude to establish savings, equipping to earn and updating local skills by making use of existing resources to encourage self-reliant lifestyles. Participation is encouraged by launching specific projects for fishermen communities, farmers and cattle owners, youth and women.

A comprehensive program for Fishermen community is developed with holistic approach to improve their Education, health, economic status, Employment opportunities, Infrastructure and social awareness.

With support of Adani Foundation, Education Scenario is changing in fisher folk community which wasn't a cake walk but with the hard work and commitment Adani Foundation has created miracles to motivate this vulnerable students to pursue Education for their bright future .

To inculcate Education in first generation learners – **SMART Balwadis are set up with an aim to provide quality education,** scholarship support to girl child along with transportation facility.

SMART Balwadi

A child's early years experience provide strong base for their lifelong learning. A Balvadi center for their holistic development was set up at Four fishermen vasahat where trained Balvadi teachers looks after Children's Physical, cognitive, Emotional and Social development.

Initiatives taken to provide Study Material and Cycle are the distributed to keep fisher folk children motivated to continue their study as well as reduce financial burden of their parents.

68 fisher folk children studying in 9th to 12th standard were provided with educational material and stationary material and Cycle support to Juna bandar secondary school going students.

Economic Empowerment is necessary for "ATMA NIRBHAR BHARAT" and Skill Development is the base of comprehensive growth. To Develop various technical and Non-Technical Skills in youth - training was conducted for Fisher Youth and Women.

Digital literacy and spoken English class:- Basic computer and spoken English training for 152 Fisherfolk students of Zarpara and Luni Vasahat which will help them to grow with confidence.

sewing training given to 26 fisher women of Juna bandar to make them Self-reliance. Planning industry tie-ups to provide them with livelihood opportunities.

Awareness programs For fisherwomen :

Fisherfolk women are still living in 19th Century, due to lack of education they are having issues of addiction, hygiene and independence.

More then **1250+ women** participated in various sessions awareness workshop at Fisherfolk settlements periodically.

Process for livelihood support to Fisher folk
39 Fisher Youth were interviewed in various industries among that 12 are selected.

Mangroves Nursery Development

Optional livelihood provision during Two-month Fishing Offseason is taken care by Mangrove Planation and maintaining at Luni Hamiramora site.

Till the date 162 hector area have been planted with Avacinia marina mangrove species which provided **46247 person days** and create environment Sustainability as well.

Years	Mandays
2012-13	6943
2013-14	1480
2014-15	3240
2015-16	3533
2016-17	3125
2017-18	3666
2018-19	7539
2019-20	6261
2020-21	5020
2021-22	5440
Total	46247

Project Fish

- *Skill Enhancement of Fisher folk Youth*

Objectives

- To Promote long-term socio-ecological effectiveness through focused interventions like employment through Skill enhancement.
- Engage more than 500 fisher folk youth in Skill Development Training to provide consistent scope of income
- Alternative incomes mean fishers are less pressured to go out to fish especially when the weather is bad
- Skill Enhancement in technical sector will motivate them for Education provision in future generations
- Livelihood interventions to improve fisheries dependent households and also reduce risk during open sea fishing

Project Goal

To develop new livelihoods opportunities for more than 500 fishing families and therefore to helping with family finances this leads to an increased sense of empowerment and confidence.

Pre-launch Activities

Brewing Big

Fish project ideation bring into existence after researching and analyzing the existing situation of Fisher folk youth and challenges they face due to which the future of the community was at stake.

The future of any community depends upon its youth. Considering this phenomenon, Adani Foundation targets fishermen youth at remotest location of Kutch district covering villages like Zarpara, Navinal, Mundra, Shekhadiya and others.

The key activities conducted before the launch were:

Mobilization - Team reaches out to villages to created awareness regarding the purpose of project and providing detailed information about training and the employment opportunities provided to them.

Counselling - A regular Interaction with every potential beneficiary to understand their educational background and interest areas along with mental and emotional capabilities. On the basis of individual's educational background and capabilities, counsellor suggests best fit course to the beneficiaries.

1 Jan' 2022

11 Jan' 2022

10 April 2022

Project Launch

Getting started

Project 'FISH' was inaugurated with an aim to enable fishermen community youth in 3 trades
Assistant Electrician, Mason and Digital Literacy.

52 aspirants from community were given an opportunity to get holistic skilled development environment by Adani Foundation under Adani Skill Development Centre. The certified training program of ___months. The expert trainers of ASDC acts as a catalyst to develop not just technical skills but to provide trainees a holistic learning platform to develop their personality and to make them industry ready.

Job Roles

- ❑ Mason General
- ❑ Bar Bender & Steel Mixer
- ❑ Assistant Electrician

Training & Beyond

Skill journey of Beneficiaries

Life at Skill Centre

Once beneficiary enrolls in a skill training program, he undergoes various modes and methods of training to develop his overall personality during his technical skill journey.

The training cycle started with theory sessions and practical sessions in respective job roles. Post that, Soft skills sessions and activity based learning sessions were conducted to boost their confidence. Though, beneficiaries start career at entry level, to grow themselves further ASDC prepares them with well with sessions like communication skills and Digital literacy.

I am happy that I am getting chance to get skilled and choose to make a living doing other occupation and no more dependent on just fishing. When my trainer appreciated my drawing skills for project and grasping power,
I got determined to study dedicatedly to score maximum in my assessment.

- Rahim Bhatti

In 3 months of training, I feel immense confidence in myself. My changed personality is even witnessed by my family and friends.
Post training session, I even do home study and discuss queries with trainers regularly to get myself prepare for my first job.

- Ayub Vagher

Initially I was hesitant to speak in class and also struggled in theory sessions. But our trainer is so supportive and helped me to understand better through practical.
I am looking forward to start my career post skill training and all set to enter into an occupation to make my parents and fishermen community proud.

- Abdullah Vagher

Transforming Lives

Home like meal service by SHG members

One of the interesting initiative of project the ‘Fish’ is the involvement of SHG group women named ‘Saheli Gruh Udhyog’ in the successful training of fishermen youth in the form of providing freshly cooked meal for the beneficiaries and arranging their lunch at training centre.

Adani Skill Development centre has given a meal service contract to SHG member and bears complete cost of beneficiaries meal and supporting SHG members in expanding their services.

About ‘Saheli Gruh Udhyog’

It’s a group of 10 members among whom, some are widows. They are making active efforts to run their SHG group by providing meal services for their sustenance.

Getting a chance to serve 52 young men for 3 months proved as a big achievement for their SHG group. *Moreover, food quality is appreciated by trainees and they express their gratitude by saying ‘the food reminds them of home as it tastes like home’.*

Sustainable Livestock Management

The inadequate rainfall and high saline ground water acts as a threat for agriculture practices. Also, cattle sustenance is the main cause of concern due to dry arid region in lean months. Adani Foundation contributed its exceptional efforts in Mundra block for consistent betterment in livelihood sector.

The organization has carried out remarkable activities in the agricultural and animal husbandry sectors i.e. Cattle Health care, Natural Farming, Soil health enhancement, Fodder sustainability etc.

Pashudhan :

Fodder Support Programme, Individual Fodder Cultivation

- Adani Foundation provides good Quality dry and green fodder to 24 Villages. Project is covering total 14116 Cattle's / 3008 farmers and hence enhancing cattle productivity. Fodder support is of prime importance for sustaining the cattle in dry months.
- Fodder Cultivation- To made fodder sustain villages - 25 Acre Gaucher land of Siracha village is being cultivated for the same.
- Fodder support MOU- with Gram panchayat at Zarpara, Nana Kapaya, Borana, Mangara, Sadau, Shekhdiya , tuna , Rampar, Dharab, Navinal, Luni, Gundala, hamiaramora , Raga
- Individual Farmer fodder cultivation supported for Maize seed and NB21 to more than 200 farmers which has created revenue of Rs. 27 Lacs

Preventive Health Care

- Adani foundation and Government Animal hospital jointly organizing Cattle awareness camps total 22 villages .
- Vaccination of susceptible animals against foot-and-mouth disease (FMD) is a well established strategy for helping to combat the disease. Traditionally, FMD vaccine has been used **to control a disease incursion in countries where the disease has been endemic rather than in countries considered free of the disease**.
- Foot-and-mouth disease (FMD) and Deworming done with 1883 cattle owner benefitted to 15700 cattle.
- Sheep and goats have weakened immune systems when they are sick with other diseases, are quite young or old, and during highly stressful events such as lambing. Deworming strategies should seek to protect these higher at-risk groups, controlling parasite levels in all animals to prevent visible effects of parasitism.
- Special Camps organized at Kira Dungar Nakhatrana for camel which benefitted 525 camels.




To protect Cattles against **Bovine Brucellosis** zoonotic disease, Awareness and vaccination program is ongoing with Kutch fodder fruit & Forest development trust (KFFT) in our 13 Villages , Last year 287 families 2132 Animals benefited. In 2021, **In Total 666 families 5083 animal benefited.**

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. In females, abortion is the major clinical sign, typically occurring between five and seven months of gestation. Most infections result from ingestion of bacteria either from diseased animals or contaminated feed. Infection may also be acquired by respiratory exposure and by contamination of abraded skin and mucosal surfaces. Infected bulls can spread the disease through semen. This disease is also zoonotic (a disease that can be transmitted from animals to people or, more specifically, a disease that normally exists in animals but that can infect humans). Under this project following activities were carried out so far,

- 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 Leaders and Gram Panchayats
- Primary Survey and Sample Collections i.e. Milk Ring Test, Blood Collection and testing
- Brucella Vaccination and Ear Tagging etc.

Sustainable Agriculture

Sustainable agriculture is to protect the environment, public health, communities, and the welfare of animals. Sustainable agriculture also promotes economic stability for farms and helps farmers to better their quality of life.

Soil Enrichment, Crop Pattern, Agro Cover, Natural Farming, Orchard Development, Tissue Culture, Water Harvesting Practices, Replacement of chemical fertilizers and pesticides, Bio intensive Integrated Pest Management are the main parameters of Sustainable Agriculture Practices.

Sustainable Agriculture benefits are:

1. Contributes to Environmental Conservation
2. Saves Energy for Future
3. Prevents Soil Erosion
4. Enriches Soil quality
5. Biodiversity
6. Sustainable Livestock management
7. Economically Beneficial For Farmer
8. Quality Food to consumers

Home biogas

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.

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

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 cigarettes.

As a Main Process, Bacteria break down organic waste in a naturally occurring process, and Home Biogas stores and harnesses the energy created so that it can be used for gas.

Sustainable agriculture Project is revolving around Home biogas which is not just utilized for cooking gas but its by product is bio slurry which is replacement of chemical fertilizers and promotes soil enrichment.

Adani Foundation has supported for **223 Home biogas system** till date with 20% participation by the community.

As per SORI use of biogas each farmer can save Rs.23399/-year. Total 223 farmers can save Rs.5217977/- in a year.

Promotion of Natural Farming

To promote Natural farming Adani Foundation has originated cow based farming initiative with interconnected techniques which can increase farmer yield – our main objective is to improve quality of soil. Pre testing and post testing is carried out for designing carbon content management of soil.

Implementation

- Survey and identification of farmers to adopt Natural farming –**Total 150 Farmers were selected as criteria in first phase of the Project.**
- Arranged Workshop & Hands on training for them which was conducted by Agri expert ,KVK and Progressive farmers with 700+ farmers
- **23 vermi compost unit have been set-up** to give guidance n training to other farmers. This units are provided Which is facilitated through Government with farmer Contribution.
- **150 Farmers have started to preparing JivaMrut & Gaukrupa Amrutam Bio-fertilizer** and using in agri crop. Series of Training is arranged by ATMA and Adani Foundation in which more than 700 farmers participated
- Four Farmers Groups is registered with **ATMA –Agricultural technology management Agency – it will leverage Government schemes**

Promotion of Horticulture : Kutch Kalptaru FPO

Kutch Kalpaturu Producer Company (KKPC) is established to address the challenges faced by the farmers, particularly to enhanced access for inputs, technology up gradation in Agri practices, output, Sorting, Grading, Value addition & marketing. by the farmers of Mundra Block in the year of 2020. The company is started with 350 shares of 280 holders, Right now it is on path of expansion up to 5000 Farmers.

Current year for the dates Packaging and Marketing, KKPC Started to sell **10 Kg capacity packaging Box** at Minimum Profit Margin At **Rs.29/Boxes** which resulted in turn over of Rs. **24 Lacs with Profit of 1 Lac.** This initiative has supported more than 1800 farmers indirectly.

Regular Director Board Meeting as well as capacity building Training were arranged.

In Coordination with KKPC, Adani Foundation has supported for Dates Offshoot plants to 100 farmers. It will start fruiting from 4th year and matured from 7th year. 4th year

expected yield is 50 Kg. and Minimum fetch rate is 50 per Kg so each farmer will produce 1000 Kg high quality dates and Rs.50000/- income from it and all 100 farmers will produce 100000 Kg dates and income will be generate Rs.50 Lacs in first fruiting year.

It will increasing year by year till 7th year, when dates plants matured and after that 2000 plants produced 300000 Kg expected high quality dates and expected income will 1.5 Cr. Approx.

Five farmers are cultivating Dragon Fruits in 2 acre each – Total 11000 plants.

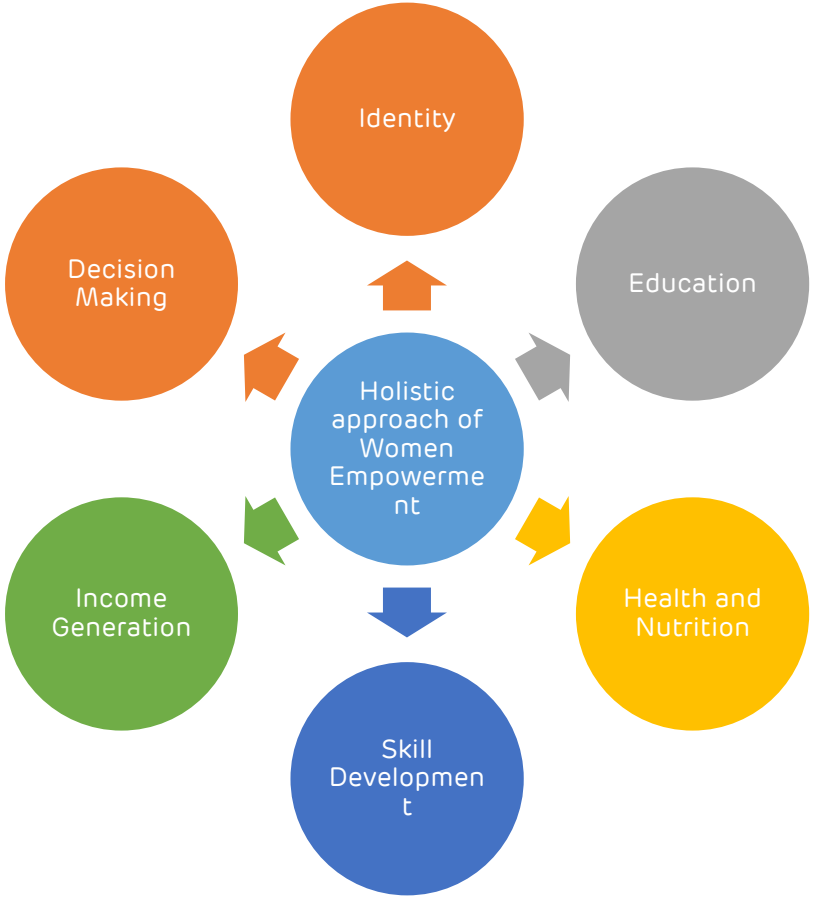
Women Empowerment Projects

Women are central to the entire development process, be it in an individual family, village, state or to a nation. Adani Foundation provides platform to community women to break the ceiling and move out as a change makers in their communities and among societies keeping their traditions intact. A considerable change has been witnessed in Mundra in terms of development of women beneficiaries in various fields of occupation like farming, self entrepreneurship, agriculture, etc. Adani Foundation has a special focus on empowering rural women and uplift by providing sustainable livelihood support resulting socio-economic shits in rural population.

The below mentioned figure shows determinants associated with the empowerment of women and these are the challenges for us as a CSR to work upon.

Adani Foundation focuses on is all parameters as a part of holistic approach towards empowering Women.

- Education – **More than 1200** girls are impacted under project Utthan. Project promotes girl child education, Creating awareness through various Govt schemes like Vahali Dikri Yojana, Sukanya Samriddhi Yojana and others.
- Health and Nutrition – Suposhan Project focus on adolescent and Reproductive age women nutrition part. Till date covered more than **12500 women** and **8700 adolescent** under this Project and brought them to considerable status.
- Skill Development and Income Generation – Adani Foundation is working with **15 Self help groups** 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.
- Drinking Water and Sanitation – Total **115** Roof Top Rain Water Harvesting is supported for hassle free household chores. **1057** families are supported for Potable water at Fisherfolk settlement to reduce drudgery of women.



Total 15 Active SHG Groups are engaged as mentioned in table Income generation activity. We facilitate them capacity building training for quality ,Marketing Finance and team work to made them self sustain.

Major Achievements:

- Saheli Swa Sahay Juth have **completed order of 15000 Sanitary pad** from District Health Department.
- "**Shradhha Saheli Sva sahay Juth**" has won tender to provide Catering service in Block level Government.
- **Tejasvini SHG has received order** of three layer mask preparation worth Rupees Nine Lacks
- **Sonal Saheli** Women SHG had **supplied 500 KG washing powder** to Adani port & Will mar.
- Shradha Saheli & Jay Adhar Saheli have been registered in FSSAI (Food safety and standards Authority of India.
- Turn over of Tejaswi Saheli, Shraddha Saheli and Meghdhanush Saheli is **@ 40 Lacs till date**.

Sr. No	Name of IG activity	Activity	Nos
1	Sonal Saheli Swa Sahay Juth	Phynale & Washing Powder	11
2	Jay Adhar Saheli Swa Sahay Juth	Dry Nasta	12
3	Tejasvi Saheli Swa Sahay Juth	Stiching,Uniform,Bag	12
4	Umang Saheli Swa Sahay Juth	Soft toys, Jula,	13
5	Vishvas Saheli Swa Sahay Juth	Tie & Die, Stitching	13
6	Jay Momay Saheli Swa Sahay Juth	Tie & Die, Stitching	12
7	Meghadhanush Saheli Swa Sahay Juth	Mud Works,	10
8	Saheli Swa Sahay Juth	Sanitary Pad	10
9	Radhe Saheli Swa Sahay Juth	Dhadaki, Small Godadi	14
10	Shraddha Saheli Swa Sahay Juth	Fresh Food	10
11	Chamunda Saheli Swa Sahay Juth	Tie & Die	10
12	Jay shakti Saheli Swa Sahay Juth	Stitching	10
13	Navdurga Saheli Swa Sahay Juth	Sanitary Pad Sale	10
14	Sakhi Saheli Swa Sahay Juth	Sanitary Pad Sale	10
15	Sonal Krupa Saheli Swa Sahay Juth	Stitching	10
		168 Members in Group	

Economic Empowerment of women means "Enhancing the role of women as drivers of poverty reduction, promoting female investors and entrepreneurs as per SDG 5" in this half year all 15 women groups did turn over of Rs. 11.5 Lacs. 43 women got job in various SEZ industries by AF intervention and 11 women got absorbed as Gram Rakshak Dal, Bank Sakhi and Bima Sakhi.

Registration Certificate
Government of Gujarat
Food And Drugs Control Administration
Food Safety and Standards Authority of India
Registration Certificate under FSS Act, 2006

/ Registration Number: **20721013000245**

1.	Name and permanent address of Food Business Operator (FBO)	JAY AADHAR SAHELI SVA SAHAY JUTH BAROI , Baroi , Mundra, BHUJ(KUTCHH), Gujarat-370421
2.	Address of location where food business is to be conducted / premises	BAROI, Baroi , Mundra, BHUJ(KUTCHH), Gujarat - 370421
3.	Kind of Business	General Manufacturing
4.	Photo Identity Card	N/A

This Registration certificate is issued under and is subject to the provisions of FSS Act, 2006 all of which must be complied with by the petty food business.

Place / BHUJ(KUTCHH)
Issued On / 12-03-2021 (New Registration)
Valid Upto: 11-03-2022 (For details, refer Annexure)

Registering Authority

Annexures:
1. Product Annexure
2. Validity Annexure
3. Registration Id Card

Note:
1. **Application for renewal of Registration Certificate can be filed as early as 180 days prior to expiry date of Registration Certificate. You can file application for renewal or modification of Registration Certificate by login into FSSAI's Food Safety Compliance System(https://foscos.fssai.gov.in) with your user id and password or call us at 1800112100 for any clarification.**
2. **This Registration Certificate is only to commence or carry on food businesses and not for any other purpose.**
3. **This is computer generated Registration Certificate and doesn't require any signature or stamp by authority.**
4. **This Registration Certificate is allowed to conduct food businesses activities having annual turnover upto Rs. 12 Lacs only.**

Community Resource Center

Adani foundation acting as bridge between Government and needy beneficiaries to facilitated government scheme leverages since 2015. and after our efforts and observation, we decided to established Community resource center, where people can have easy access for Guidance and complete all necessaries document for Government Scheme.

CRC is Located just near to Mundra Bus stand and known to all People.

In the year of 2021-22 Total 667 people have benefitted through CRC center

Total 2243 beneficiaries have been benefited and get support through Government and Adani Foundation. Among them more than 712 people have been getting financial support as Monthly base that is. Rs16.Lacs

Scheme Detail	Beneficiaries 2021-22	Remarks	Total Beneficiaries	Revenue Convergence (Rs)
Senior Citizen	10	Rs.750/ Month	104	78000
Online Application	13		13	
Widow Pension	289	Rs.1250/ Month	526	657500
Medical Certificate	59		59	
AF Support	32		32	
Divyang pension	2	Rs.1000/ Month	7	7000
E-Shram CARD	8		8	
Divyang Job	14		14	
Sukanya	123		123	
Vahali Dikri	23		23	
Bal Yog Yojna	51	Rs.2000/ Month	51	102000
Covid -Support	13	Rs.50000/ one time	13	650000
Aditya birla Scholarship	30		30	
palak mata pita		Rs.3000/ Month	9	27000
sanakat Mochan		Rs.40000- One Time	2	80000
Tool and Kits Support by through Government			1057	
Support By AF (Widow and Divyag)			159	
Ration support To Widow and Niradhar			13	
Total	667	0	2243	1601500

Project Swavlamban

Project Swavlamban Launched with an aim to make **differently abled people of MUNDRA TALUKA self sustainable.**

Our objectives:

- To increase awareness about Government schemes for Divyang people, widows and senior citizens and coordinate them with Social Welfare Department, Government of Gujarat.
- After getting income generation equipment support - Proper training provision to make them self-reliant in true sense!!
- Adani Foundation is playing key role as facilitator in case of tie up with Government Scheme for Widows, Senior Citizens and Handicapped people. The identity cards are issued for the handicapped in coordination with Bhuj Samaj Suraksha Khata which is beneficial for them to get specific kit for their disability type. This year **154 beneficiaries** linked up with pension scheme.
- The financial benefit of the senior citizen Yojana is Rs. 500 per month and the widow scheme is of Rs. 1250 per month. Jilla Samaj Suraksha Officer and team remain present every time.

Community Infrastructure Development

Building a strong community relationship is the key to progress of Adani Foundation. The programs such as Education, Health and Sustainable livelihood development play a very important role in building this strong relationship with the community. These three programs are incomplete without the inclusion of the Rural Infrastructure Development program.
This year on path of sustainability, we have taken some steps as follows...

Under Fisherfolk Development Project, Adani Foundation has constructed 46 shelters at Randh Bandar with pre cast structure. Fisherfolk Community cum Training center is the biggest project of current year and will also create impact as a boon for fisherfolk youth for various trainings.

Balwadi development work at Bandar and Shed for Adani Skill Development Center for technical trainings will also improve quality of many lives in true sense.

- 23 Fishermen of Randar bandar are benefitted to Pakka House constructed under AF Fishermen Avasa yojna
- Renovation and Up-gradation of Check Dam & River Rejuvenate work at siracha and Bhupur villages.
- RRWHS & Bore well recharge Construction at Various Villages.
- Basic amenities and maintenance and reparing work at all Fishermen vasahat.
- Community gathering and training Center construction at Different villages
- LED Street Light and Sky Lifter Structure at Municipality Mundra Baroi.
- Supply & Fixing of Hi Mask Tower at Gundala village work.

Adani Skill Development Centre

A section 8, not-for-profit company, registered on May 16, 2016, 'Adani Skill Development Centre' is an initiative of Adani Foundation. ASDC focuses on skill development activities to contribute towards nation building by bridging the skill gap demand & supply, in line with Government of India's Skill India Mission.

"SAKSHAM" is an ideology of the Adani Skill Development Centre to make youth of India 'SAKSHAM' (capable) of achieving their goals in life by becoming skilled professionals.

Mobilization and Counselling

Theory and Placement support

Practical training for all job roles

On the Job training

Post training placement support

A strategic model of skill training is implement by ASDC in which Mobilisers visit remotest locations to encourage youth and women to get skilled, Counsellors provide in-depth information and assist in suggesting need based course, Certified trainers with expertise provides theory and practical training. Trainees are provided with soft skills sessions and interview preparation sessions to make them employable and industry ready. For each batch, ASDC team will arrange Panel Interviews and Campus Interviews for trainees to get directly selected as soon as they complete training.

ASDC Bhuj

Practical Training : As a training part we are conducting other activities. We have conducted Learn with Fun activities, Parents Meeting, Certificate distribution program, Preparation for Interview etc.

Women's Day Celebration : Conducted 7 days seminar to empower female candidates in line with International Women's Day theme. More than 60 women participated.

Educational Exposure Visit of GDA candidates (DDU-GKY) at K. D. Hospital Ahmedabad. 21 candidates visited.

Guest session organised for trainees to provide them soft skills training and make them industry ready with a doze of motivation.

Certificate distribution to GDA batch Students

Course wise Admission Bhuj

Name of Trade	Total
General Duty Assistant	90
Digital Literacy	42
Financial Literacy	45
GST with Tally	169
Frontline Health Worker	11
Welding Technician	1
Basic Functional English	5
Beauty Therapist	5
Logistics & Supply Chain Management	1
Junior Crane Operator	3
Occupational Safety and Health Administration	1
Pedicurist and Manicurist	2
Domestic Data Entry Operator	2
Diet & Nutrition	41
First Aid	81
Total Admission	**499**

Name of Trade	Bhuj	Kutch University	Chanakya College	DDU-GKY	Total
Total Admission	97	179	191	32	**499**

Name of Trade	Total Trained	Placement	Self-Employed	Upskilled
General Duty Assistant	32	10	0	22
Digital Literacy	38	0	0	38
Financial Literacy	20	0	0	20
GST with Tally	92	0	0	92
Beauty Therapist	3	0	3	0
Junior Crane Operator	3	1	0	2
Pedicurist and Manicurist	1	0	1	0
Domestic Data Entry Operator	1	0	0	1
Diet & Nutrition	41	0	0	41
First Aid	41	0	0	41
Total	272	11	4	257

Name of Trade	Mundra
Basic Functional English	170
Digital Literacy	152
Self Employed Tailor	120
Pedicurist and Manicurist	107
Junior Crane Operator	54
Mason General	42
Bar Bender and Steel Fixer	42
Dori Work	22
Mud Work	18
Assistant Electrician	10
General Duty Assistant	6
GST with TALLY	5
Beauty Therapist	2
Data Entry Operator	3
Checker	1
5S	1
Total Admission	**755**

Placement Details for the F.Y. of 2021-22 (Mundra)

Name of Trade	Total Trained	Placement	Self-Employed	Upskilled
General Duty Assistant	6	0	0	6
Digital Literacy	99	0	0	99
GST with TALLY	5	0	0	5
Mud Work	18	0	18	0
Basic Functional English	105	0	0	105
Dori Work	22	0	22	0
Junior Crane Operator	46	25	1	20
Data Entry Operator	3	0	0	3
Pedicurist and Manicurist	27	0	27	0
Self Employed Tailor	29	0	29	0
Total Admission	**360**	**25**	**97**	**230**

CSR Nakhtrana

Adani Green Energy(MP) Limited (AGEMPL) proposes to setup an integrated wind energy project as Green Energy Works which includes Limestone 750 Mw, Through approx. **1250 windmill** at Dayapar to Nakhtrana in District Kutch (Gujarat).

- Socio economic survey of Widow women and than linked with Government Widow pension scheme Rs.1250 /Month. Total **246 widow women have been facilitated with Widow pension scheme** with convergence of Rs.307500 /Month on Regular basis.
- **Till the date 22 Bore well** were recharged at Ugedi and Deshalpar Villages. Two pond deepening work and **4 Old check dams** were repaired. Tree Plantation at Jinjay & Ugedi Villages Primary schools.
- **Government Scheme Awareness Session** was held at Deshalpar village on the silver Jubille of Foundation day .
- **Distribution of 1000+ Mangoes Sapling** to farmers of Ugedi and Deshalpar Villages for promotion of Horticulture farming.

CSR Lakhpat

Adani Cementation Limited (ACL) proposes to setup an integrated cement project as Lakhpat Cement Works which includes Limestone Mine in 251.9 ha area.

Main focus of Adani Foundation is to prevent community from life threatening diseases and provide basic healthcare services.

Activities:

- Barred land of the Kapurashi crematorium afforestation with **2222 different type of trees in collaboration of forest department and Bhagvati Gramaya Vikas trust**. Arranging **water pipelines to facilitate regular watering** of plants to ensure nurturing. Impact: Attracts peacocks and other birds at crematorium site.
- General health camp and speciality health camp was arranged frequently at villages. More than **425 Patients were diagnosed and refer to GK General Hospital** for further treatment and operation if needed.
- Sewing machine training was conducted Kapurashi women. Main objective of the training was to empower women to boost their self confidence and thus financial independency,

CSR Tuna Port (AKBPTL)

Adani Kandla Bulk Terminal Pvt. Ltd. is joint venture of Adani Ports and SEZ Limited and handles all types of dry bulk cargo including coal, fertilizers, minerals, industrial salt and agriculture products.

Various activities were carried out for the community development under core areas of Education ,Health ,SLD & community Infrastructure of Tuna ,Ramapar Vandi villages and Fishermen vasahat

Rural clinic and MHCU

Basic health facilities is being facilitated through Rural clinic and MHCU to Rampar, vandi and Tuna village.

Specialist health camp was arranged at Tuna Villages. More than **184 patients was diagnosed and treated** as well as suggest to GKGH for Further test and treatment.

Drinking Water

Potable water supply to Dhavlavaro and Vira bandar vandi villages impact on fishermen health to reduce water born disease.

Covid Vaccination camp

covid vaccination camp was held at AKBTPL for labors and security Staff through government health department.

Fodder support

Fodder scarcity is always remained prime need of farmers which is being resolve through Fodder supply intervention TO Rampar and Tuna village from April to July -2022 which improved cattle health and milk quality.

26680Kg Dry fodder support

721855Kg green fodder support

Pond deepening and bund strengthen of Rampar village pond increase water storage capacity.

Construction of Community gathering center at Tuna village provide access for community function and training as well.

Water pipeline installation near to village pond to Watering tree planation which was developed by villagers and maintain regularly.

CSR Bitta

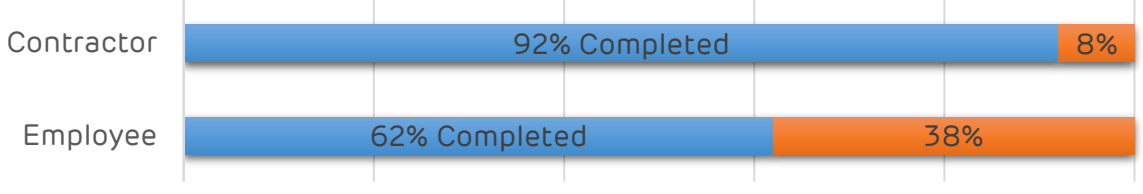
One of the Largest single location solar power project was commissioned by the Adani Group at Bitta, in Gujarat in year 2011. It spans a vast area of 450 acres. The massive plant comprises 2 lakh solar modules, 73782 foundations, 4500 tons of structure, 2800 km of cables, 56 inverters and 33 transformers. And now fully operational mode as well as connected with the 66 kV GETCO substation of GETCO TO powering 16,326 homes in a suitable manner and for the Sustainable rural development various Activities was carried by AF as mentioned.

- Avail Dinking Water and drainage line facilities by availing pipeline connection to Dhufi village which reduce drudgery and lead toward 'Swachh village'.
- Repairing and maintenance Bavnipar village cricket ground to offer hassle free playing ground as well; crated strong repo with Youth.
- Cleanliness of village Pond inlet in the Bita Village which lead more storage capacity and Village. Pond bunding construction in Dhufi village.
- Support Bita Primary school with Four Solar Light which reduce Electricity consumption and nurture renewable energy concept.
- Pota container and LED light support at Mathla check post for security and safety purpose.
- Cleanliness awareness session was conducted with Cleanliness program with youth involvement to create my Village clean village concept.
- Panchayat Building construction was carried out by Adani Foundation's support and technical guidance.

Dignity of Work Force Programe - 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
155

No of Trainers:
89

No of days
44/50

Total no covered:
3433/3906

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 initiated screening with 2300 work force in first phase with target of screening more than 10,000 workforce of all group businesses and SEZ Industries.

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

"जन जन को जगाना है, टीबी को भगाना है"

Dignity of Work Force Programe - EVP

"Joy of giving week" celebrated by employees of APSEZ and AWL by distributing clothes and stationary items to labour workforce of APSEZ.

More than 7500 Clothes distributed to 650 workers of Labor Colony.

Support to children Vallabh Vidyalaya

In year 2018-19 year Adani group employees has adopted **704 students** and in year 2019-20 adopted **800 students** who are from families of migrant labourers working in various industries in and around Mundra.

And in 2021, **997 students were registered and** to make employees connected with children Vallabh Vidyalaya regularly send progress report twice in a year. Current year Women group of Samundra Ladies has donated Rs. 55,000 for support activities of School and motivation to teaching staff in street education.

De-addiction Awareness Campaign is going on with "Prajapati Brahmakumaris" at Labour Vasahat Areas. This campaign has changed life of many labours. Cleanliness Drive is organized in May and August with Adani Willmar Limited at vasahat areas. In this series of event 225+ labours remained present and 9 labours took pledge to leave liquor and Tabaco.

Events

Community Resource Inauguration

Inauguration of **'Community Resource Centre'** to support and facilitate community regarding various government schemes.

District Magistrate of Kutch Ms.Pravina D,K , IAS, District Development Officer was guest of Honour. Other dignitaries present was Mr Bhavya Verma – IAS ,Director, DRDA Mr Joshi , Director- Social welfare office Mr Arvind Rohadiya, Mr Chaudhary Sub Divisional Magistrate , Sarpach and volunteers from villages were remain present.

'**Schematic Guideline book super -51**' book launch on 3rd April . Book consists in-depth scheme information on , Health, Education, Fisher folk based schemes and Social welfare schemes.

All dignitaries along with National Rural Livelihood Mission (NRLM) **visited to Sanitary pad making unit**, ensuing support to create sustainable Group.

International Day of Persons with Disabilities

International Day of Persons with Disabilities is an international observance promoted by the United Nations since 1992. Since 2011 – **Adani Foundation Mundra is celebrating the day with enthusiasm and Zeal in coordination with District Social Welfare office** by planning various support to divyang people.

Adani Foundation has supported **more than 35 Divyang** to initiate their livelihood i.e. Stitching, Flour mill, Ration shop, E-Rickshaw, Gift Shop and Agarbatti making machine. In connection with this, current year Adani Foundation has organized **'Divyang Employment Fair'** in coordination with more than 14 Industries of Mundra on 1st December 2021. Same platform was utilized for distributing "**E-Shram Card**' with Labor Commissioner of GOG which will give benefit of Rs. 2 Lacs accidental Insurance and unique pension scheme (3000 INR per month for any Divyang after age of 60 years) for all Disable people of Mundra.

Total 28 Divyang had applied for interview and out of them 11 received confirmation for job. Apart from this 92 E-shram cards were developed.

World Wetlands Day programme

Adani Foundation, Mundra and Gujarat Institute of Desert Ecology (GUIDE), Bhuj-Kachchh has jointly organized the **World Wetlands Day programme on 2nd February 2022**

Shri. V. S. Gadhavi, IAS (Retd.) was the chief guest proceeded by Smt. Pankti Shah and officials from Adani Groups and Adani Foundation along with Dr. V. Vijay Kumar, Director, GUIDE and scientists from GUIDE were participated in the programme.

Eminent personalities; Prof. K. Padmakumar, Former PVC Kerala University of Fisheries and Ocean Studies, also Director, Centre for Marine Biodiversity, Department of Aquatic Biology and Fisheries, University of Kerala delivered an enlightening talk on "Mangroves Ecosystem – Global and Indian Perspectives".

Prof. I. R Gadhvi, Head, Dept of Marine Sciences, Maharaja Krishnakumarsinhji Bhavnagar University delivered a talk on "Mangrove Scenario of Kachchh" and in his talk highlighted the increase of mangrove cover especially in Kachchh district.

Dr. Sheetal Pachpande, Mangrove Foundation, Mumbai delivered a talk on "Mangrove Interpretation Center" that highlighted replication of such centers in Mundra, Kachchh for enhancing the knowledge among students, naturalists and local inhabitants in mangroves and marine sciences.

Students from the HSC Science school of Mundra .Block are Partcipated in Drawing competition and Students from Maharaja Krishnakumarsinhji Bhavnagar University, Bhavnagar; Atmiya University, Rajkot Did paper presentation. Among them decalared 1st winner for Paper presentation and 1st to 5th winner for Drawining competition as well Provide Precipitation certificate to all.

Apart Them Site Head and Adani foundation and All site head were remain present Virtually Program is conveyed by Mrs Panktiben Shah –UCH and concluded by Shri. V. S Gadhavi, in which he has pointed out the conservation and management of coastal and mangrove ecosystem and the need for the preparation of long-term action plan for the effective conservation of the same.

International Women's Day

Activities:

Bhuj
- Session on Gender Equality and Women Empowerment at G.K General Hospital, Bhuj. The guest of honour was Mr Nimaben Acharya, Speaker, Gujarat Vidhan Sabha.
- Felicitating **Disha Gada**, a woman pilot who rescued 275 students from Ukraine.

Mundra
- Session on Importance of Health and Hygiene for women organized in association with Rotary Club at Mundra.
- Honored 230 women of best two blocks of Anganwadi with certificate and memento for their successful contribution at work.

Nakhtrana
- General Health camp was organized at Nakhtrana Gram panchayat specially for women in collaboration with GKGH.

- Utthan
- Recreational activities for woman sahayaks, Educationalist, Principals, Sarpanch of 42 Utthan schools.

2059 Women participated in celebration of Women's Day week.

Fishermen Youth Employment Training

Inauguration of Technical Skill Development Training Program for the Fisher folk youth by Adani Foundation

Adani Foundation and Adani Skill Development Center had jointly inaugurated of the **"Technical Skill Development Training Program for Fisher folk youth on 10th January.** To Promote long-term socio-ecological effectiveness through focused interventions like employment through Skill enhancement and "To improve fisheries dependent households

In Phase I, 51 fish folk community youth will be skilled and certified in job roles like Assistant Electrician, Mason and Bar bender under 90 days training program supported by placements.

World Environment day Celebration

- Adani Foundation celebrated World Environment day on 5th June with Inauguration of Maiyawanki forest development.

Activities done on World Environment Day:

- **MOU with KSKV Kutch University** and Adani Foundation to provide technical guidance on **'Cow based'** natural farming.
- Conducted **training on 'Jivamrut' and 'Vermi compost preparation'** to farmers promote cow-based natural Farming with Home Bio-gas distribution.
- **Inauguration of Miyawaki forest developed at Nana Kapaya village** in 2.5-acre land with collaboration of Forest and Manrega Department and Gram Panchayat participation.
- **2000 trees have been planted with spreading awareness among people at various places of Mundra, Nakatrana and Tuna location.**

Adani Foundation Day

Silver Jubilee of Adani Foundation was celebrated on 11th August at Adani House Mundra. **11 women** were felicitated who have done Remarkable work in the their filed of Agriculture , Education , Entrepreneur, Government and having special recongnization among society and Communities for their work by Shree Rakshit Shah, Executive Managing Director- APSEZ and HR Head- APSEZ.

Also felicitated first fisherman youth- Shakil Manjaiya with Offer letter to work with APSEZ after completing Mechanical Diploma.

World water day celebration

World water day was celebrated on the Theme of "Groundwater, making the invisible visible" at Adani House auditorium **felicitating all progressive farmers with a memento** who have done remarkable work for water harvesting and management as an individual and at village level.

The event was graced by chief guest, Mr. Dipeshbhai Shroff, President of Kutch Nav Nirman, Mr. Rakshit Shah- EDM ,APSEZ , Mr. Yogesh bhai Jadeja Director of Arid Community and Technology, Mr. Niraj Kumar, Deputy director of NABARD ,Kutch.

Mr. Rakshit Shah, Executive Director, APSEZ expressed compliments to all **14** progressive farmers for their exceptional work for water conservation and management.

International Coastal Cleanup Drive

Indian Coast Guard, Adani Foundation team, NGO team, Students of SV Arts and Commerce College unanimously dedicated a day to clean Mandvi Beach and to create awareness among local community towards save guarding coastal areas by becoming responsible citizen towards clean ocean.

Utthan Second Phase Inauguration

Inauguration of Phase II of Utthan was inaugurated on 28th September spreading its impact to more 14 schools. On this occasion District Primary Education Officer, Utthan schools Principal and teachers have graced the occasion.

"Like an Oasis in a desert"

Dema ben's family has returned home from a neighbour country in 1971 war. Today Demaben is happy to be in her own country but prior to that she and her family faced lot of stress and underwent a lot of trauma living in a conflicted place away from home.

She lives with her Husband and daughters. Her one daughter is suffering from mental illness and completely dependent for care. Her husband is doing labour work in farms. He is sole bread earner of this vulnerable family. Being single earning person of the family doing labour work and a responsible father of a dependent daughter, his income is never sufficing which creates constant distress in family. Her willpower is strong, but all these did a toll on his health, and she suffered constant headache, Fatigue, High Blood Pressure, Nausea, etc.

Demaben Umed
Village Pragpar-2, Kutch

Dr. Mukesh Parmar, Adani Foundation inspected her condition, her BP was 197 /97 mmhg. He immediately started symptomatic treatment and later second follow-up, Dr started anti-hypertensive treatment and provided required medicines and advised her some lifestyle changes and list of food items to add in her regular intake of meals. On regular follow-up checkups and treatment, Dema ben followed her road to recovery. Dr has witnessed steady progress in her health, and she finally got a relief from a disease.

She expresses gratitude in her vernacular language expresses Adani Foundation as 'વિરાન જંગલ મા મીઠા જલ ની વિરડી સમાન' meaning 'Sweet water well in barren Jungle'.

"Live many more years Chacha!"

Ramzan Adam Chacha lives with his family at Juna Bandar. For the last 8 years he is the victim of Kidney Failure. He needs to go for dialysis regularly. However, the treatment facility was only available in Bhuj which compelled him to travel to Bhuj for 2 days in a week. He had to skip his work for the days, if there is any delay in his dialysis routine, which is very difficult situation for a fisherman whose income depends on daily catch, he need to skip his work to rest. Moreover, in his thin financial position, it was difficult for him to arrange money for the treatment and transportation too was a big issue. Learning about dialysis centre at Adani Hospital Mundra, he approached for aid from Adani Foundation.

Ramzan Adam Chacha
Village Shekhdiya, Kutch

In no time Adani Foundation team planned a routine dialysis for him against no cost. Earlier he used to visit thrice in a week and from the last two years, he is coming twice in a week. "Watching him every year is the biggest source of inspiration for not just me but our whole team. I wish Chaha to live many more years" says Manharbhai, Adani Foundation Employee.

"Mari toh umer vadhari didhi Adani Foundation e, treatment ma sahay kari," chuckles Ramzan Chacha in his local language. Meaning "Adani Foundation has prolonged my age by providing Dialysis support for the last 8 years".

: ‘Hands are softer than a stick’

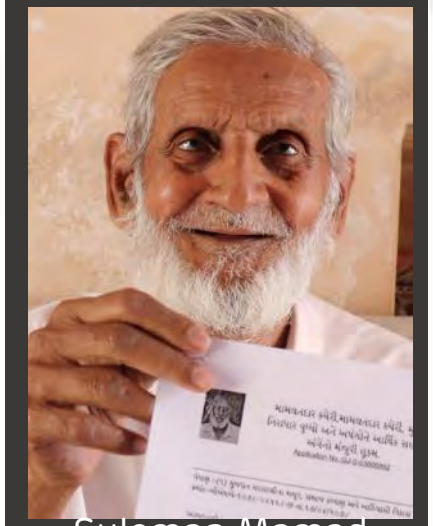
A senior citizen named Suleman bhai hails from Pragpar village. Father of 6 girls out of which 5 got married. He lives with her wife and 1 daughter. Both Suleman bhai and his wife are senior citizens. Being a father of 6 girls, Suleman bhai was concerned about his financial situations, this did not stop him from giving best life to his daughters. 5 of them got married and youngest one is graduated. Suleman bhai and his wife along with daughters used to work as house helps and did labour work to earn living.

Due to their slim economic condition and constant labour work, Suleman Bhai's health started deteriorating. He started having blur vision, watery eyes and constant discomfort in his eyes. On consulting doctor, he got to know that he needs to undergo cataract surgery for both his eyes. It was heart wrenching to know for the family as the cost of surgery was too high. Someone recommended him to consultant Doctor from whom he got to know about ‘Adani Vadil Swasth Yojana’ under which Adani provides necessary health care support to senior citizens who are from underprivileged families. He inquired about the scheme and immediately completed all the necessary procedures to avail benefit of the scheme.

After completion of necessary formalities, He got his cataract surgery done for both the eyes on pro bono basis. He and his family were overjoyed that the surgery happened on time, saving his eyes from complete loss of vision. From here, Sulemanbhai stayed in constant touch with Adani Foundation team as a family.

He was also counselled about Vrudh Pension Yojana scheme of government by concerned Adani Foundation employee under which seniors above the age of 60 receives Rs. 750/- monthly in the form of pension. Adani Foundation has a dedicated group of employees working for rural senior citizens providing liasoning support to avail benefit of schemes to support the community. Under ‘Vrudh Pension Scheme’ both Sulemanbhai and his wife received Rs.1500/- every month. It might not be suffice but for them, it’s like a shade of tree from scorching heat.

On receiving amount for the first time, they contacted AF and expressed gratitude. He also encouraged his daughter Ruksana to spread awareness about these schemes to fellow villagers so that they can also get benefit from these schemes.



Suleman Mamad Kevar
Village : Pragpar

A naturalistic learner, shines bright in the class!

We have been fascinated to see how the holistic development took place in Seda Malshree Karaman, studying in class 5. An introverted student transforming into a dynamic learner is not only surprising to us but also to her family members. Mr. Mahendrasingh Solanki, School Principal of Zarpara Shala no. 3 says "I would like to congratulate Utthan team and Utthan Sahayk named Rajendra Chauhan for his commendable work in empowering progressive students and bringing them in line with average and above average performance level."

Malshree's story of transformation began during the pandemic period when schools were shut, and education was made available for the students at their doorstep under the title 'Sheri shikshan' provided by the Government of Gujarat. Seda Malshree Karaman was in class 4 in 2020. However, she is finding difficulties with the minimum level of learning.

During the home visit, Rajendra(Utthan Sahayak) met Seda Malshree. Initially, dealing with an introverted child was challenging. But slowly, within 10 days, he could boost her confidence.

On mentoring her regularly, Sahayak identified that she was a 'Naturalistic learner'. From the very next day, he started teaching Malshree with multiple natural resources which are easily available at her residence lived in 'Wadi'(backyard).

This was observed by her parents too. Slowly and steadily, Malshree took an interest in language and arithmetic. Gradually, Mr. Rajendra measured her learning outcomes by conducting a timely assessment. Her academic growth inspired other students too to give a lot of attention during classes. Today she is in class 5 where she can read, write, and do basic arithmetic calculations.

Name: Malshree Seda
School: Zarpara Shala No. 3

Hanif Mohammad
School: Deshalpar Group Shala

As Sunflower faces Sun, Progressive students always look forward to Sahayaks

Hanif, a small child was abandoned by his parents. Such young boy might even don't know what happened to him and why his parents left him. Hanif might not ask these questions today as he is too young to absorb all of it but it did affect him mentally and emotionally. It was obvious to feel isolated and different from other fellow student.

On one side, he is dealing with this somber transformation in life and adapting to living life with his uncle and aunt, and on other side, he has this immense interest and curiosity towards knowledge but lacked direction in life and also in academics. Under project Utthan, the purpose is to identify and uplift progressive students and bring them at par with fellow students. To do that, it's the duty of Sahayak to know a student inside out and that's what happened to Hanif.

On regular interaction, Uthhan sahayak motivated Hanif and taught him to start reading and practice writing skills. With consistent efforts Sahayak managed to make Hanif regular in school and made sure he does his homework daily. Not just that, Sahayak shared inspiring stories and motivated him to participate in 'Bal Mela Program' in which Hanif with the support of Sahayak prepared a Wind Mill from the waste. The project was successfully exhibited receiving appreciation from the visitors at Mela.

It is said that 'Distraction heals Pain' and in Hanif's case, he has completely changed his focus from pain towards his passion for learning. Hanif is rejuvenated to learn in this new academic year holding Utthan Sahayak's hand.

Anju Chauhan
Village : Zarpara

Uplifting progressive students

Little Anju studies in class 4th of Zarpara Primary School. She was in 2nd Class when the lockdown declared. Unlike urban schools, rural students do not get a chance to immediately start learning through online platforms. In such situation, Utthan Sahayak initiated online teaching and mentoring and tried to reach out to rural students who do not have access to mobile phones in their families.

Anju could not cope up with her education for 2 years and when she resumed school, she found out to be a progressive student due to her inability to read, write and count. School teachers noticed Anju's poor performance and handed over her case to Utthan Sahayak. It took few months, where one to one mentoring and teaching sessions were arranged for Anju and dedicated Utthan Sahayk made rigorous efforts to improve Anju's performance till examinations, preventing her from failing in class.

"Hard work and consistent efforts of Anju is appreciable. Yes, the start was tough but I was determined to bring Anju out of progressive students zone to average learner and we did it successfully." Says Bindya, Utthan Shayak

Adani Foundation as 'Moonbeem in Valima's lightless life.'

Valima is a senior citizen with disability (blind with both eyes) residing at Gurjarvas of Kutch District. Living in extremely poor condition. Her story is heart wrenching. She has proved to be an epitome of strength. She is a strong woman and even stronger as a mother who is taking care of her divyang and mentally challenged daughter who is 30 years old as of 2021.

One could get goose bumps to witness how this old blind mother takes care of her divyang daughter. Valima's two sons got married and started new life leaving mother and sister to suffer and survive on their own. With no vision but only pain in her eyes, Valima has fulfilled all responsibilities but now she is old. Adani Foundation's encounter with Valima was a beginning of the end of her problems. Earlier when her husband was alive, he used to make arrangements for family's survival. But now, Valima being blind and living in remote area is unaware of any of the schemes which can ease her living. Moreover, to get support from any of the rural development scheme, on needs identity proof and documents. Kanta, her daughter was not even having her identity proof, Valima was unaware of her widow pension rights and the support provided to divyang by government.

Here comes the role of Adani Foundation, to support the most needy and vulnerable who is completely devoid of information and their rights. Under project swavlamban, Adani Foundation provides end to end support to senior Citizens, Divyang and Widows. Adani Foundation team assisted valima to get necessary documents first. Starting from Ration card, Adhar Card, Voter Id, Disability card and Bank account was requested for her daughter and mother from respective departments . Post completion of all necessary compliances for documents, Valima started receiving 'Senior Citizen Pension', 'Widow Pension' and got free 'Bus Pass' for their ease of mobility.

Name: Valima L. Sibhi
Gurjarvas, Mundra

Narpant Singh Jadeja
Village Hatadi, Ta. Mundra

Overshadowing disability with his ability to make living.

Narpat singh resides in outskirts of Mundra. He lives a simple life. He, being Divyang, is unable to walk. Before few years, Adani Foundation provided him wheelchair for his ease of life. That's when he met Foundation team and stayed connected. His life was in routine before pandemic. He used to run flour mill and earn basic livelihood. At times, the mill does not work and creates problem. In those situations, Narpatbhai himself juggled with spare parts and repair it.

In 2021, His flour mill stopped working. He tried repeatedly but could not repair it by himself. Due to his less mobility, he was not able to move out and explore other options to repair it. With damaged machine, his income also stopped, and he got worried for his living. He contacted Adani Foundation again for the support. On inspecting his machine's condition, Adani Foundation decided that it does not require repairing, it requires total replacement.

Narpat Singh took a breath of relief as he was provided with new flour mill. 70% cost of flour mill was borne by Adani Foundation and 30% by Narpat Singh. Hearing about his new flour mill, villagers again started visiting Narpatsingh and his earning rose to 8000/- from 6000/- monthly.

Shakil Manjaliya
Village : Luni, Ta. Mundra

"From AVMA to APSEZ, Fishermen communities pride'

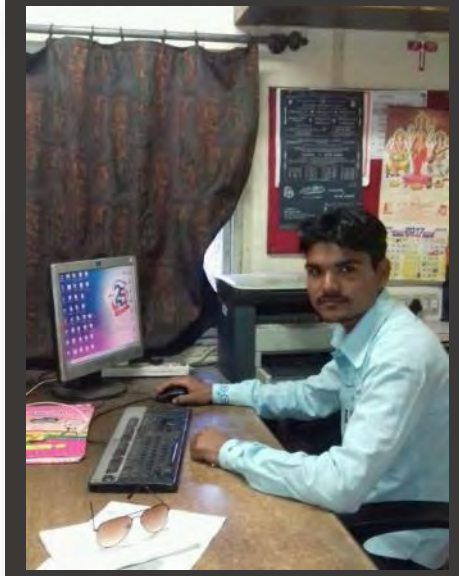
"From fishing to studying, from helping to hold a pencil to helping to have a social position, from my first book to my first offer letter, Adani has played a key role in my life." Proudly states Shakil

Shakil, A first generation learner of a fisherman community has studied in Adani Vidya Mandir School. It is an initiative of Adani Foundation to establish a school to provide free education to underprivileged and economically challenged community children providing best in class education for their bright future.

Hailing from fisherman community whose income mostly depends on daily wages, it was impossible for his parents to bare the cost of his education. Learning about Adani Vidya Mandir school, they applied for his admission. They fulfill the criteria of a deserving family and shakil's journey of change began by studying in school. He got 78percentage in 10^{th} standard, which motivated him to pursue engineering stream. He then, successfully completed Mechanical Engineering Diploma course and applied to APSEZ.

His intelligence and hard work surpassed his poor financial conditions. All the struggles he and family faced due to low income have come to an end. Shakil says "I used to dream in Adani Vidya Mandir that one day I will work and earn enough to change my family condition."

It's a fruit of his continuous sowing of hard work and dedication that he reaps employment in APSEZ. He got his first offer letter from Mr Rakshit Shah, EDM, APSEZ. Not just his family but even his teachers of Adani Vidya Mandir are proud of him today to see him grown so far and starting his career as first generation learner of his family who has managed to get livelihood in the form of job. Small steps taken for years will now lead to an socio-economic shift for all those fisher folk young boys and girls who have completed their education and will enter into a professional world with a dream to bring out community from a difficult living to an improved standard of living.



Ishaq
Village : , Ta. Mundra

"There is no greater disability in society, than the inability to see a person as more." – Robert M. hensel

Ishaq is a young 29-year-old responsible husband and a sole bread winner of a family. He was 14, when he got hit by Polio. He managed to complete his schooling and got H.S.C cleared successfully. He also achieved computer diploma degree to cope up with the present work scenario. Hailing from a Fisherman community, he is a first-generation individual who dreams to get employment. He always dreamt of working with Adani but never applied as he thought he is not ready yet. Therefore, He decided to get work experience for couple of years and apply confidently.

On one occasion where Adani Foundation organized 'Divyang Rojgar Mela' where Ishaq applied in an interview and showcased his knowledge, skills and dedication towards work. *Looking at his zeal and agility towards work and his preparedness, he was offered a job as a weight-bridge operator Job in APSEZ.*

Ishaq elated receiving an offer let his dream company and made his community extremely proud.
With open arms, Adani always welcomes Talent Divyang and Energetic Fisherman community to join hands for nation's growth with goodness.

Dipak Maheshwari
Village :

Getting back on track with Sheri Shikshan !

Dipak Maheshwari is a student of Muru Primary School. Losing his father at an early age has made him numb and inattentive in class. At first, he showed no interest in studies and slowly he started skipping lessons. His irregularity was concerning his school teachers where Utthan Sahayaks are contributing their mentorship and guidance to progressive student.

The root of his loss of interest in academics and difficulty to cope up with academics has started when his father was constantly keeping unwell and losing him has made Dipak vulnerable. He lost hope and was tired of making efforts to balance his emotions and studies. He chooses to remain at home.

On learning about Dipak's situation, Utthan Sahayak visited him to check on his mental and emotional condition. When Utthan Sahayak visited his place, Sahayak decided that it was not the right time to push Dipak to attend school, therefore he planned to teach Dipak under Sheri Shiksha teaching methodology (Study at home under the guidance of Sahayak).

Dipak found comfort and developed great understanding with Shayak and was able to grasp Foundation Learning Numeracy. Sometimes with written and other time by activities, Dipak used to study well. When he resumed his confidence and zeal back on track, Sahayak encouraged him to start his schooling again.

Utthan Sahayak keeps close contact with his family and still keeps a track on his academic performance.

Rasilaben Goyal

Right treatment at a right time !

Rasilaben is a 28year old woman from Fechariya village, Kutch. She has 6 sisters and 1 brother. Her father died due to cancer. Family's financial condition was stressful because they have incurred lot of expense for father's treatment but couldn't save him. Rasila, being the eldest among all sibling took all responsibilities on her shoulders. Loosing husband and a father of 7 children, Rasila's mother suffered a huge shock. She could not come out from the trauma and started keeping unwell. Unfortunately, her mother died in just few months after the father's demise. Situation could not get more worse than this for the family. Rasila had her uncle who used to run a small tea shop, he used to help family a bit as per his own capacity.

In 2013, Rasila started facing some health issues. She used to complaint of trouble in her stomach and also was facing gynecological problems. On her visit to hospital, she came to know that she has ulcers in her intestine. Her world had turned upside down, her siblings were not prepared to hear this devastating news. She started her treatment with a hope but continued to manage household chores and responsibilities of her siblings. But, the cost of treatment was 3,000 to 4,000 monthly, which is too much for a family to manage on their own. In such critical situation, they were in dilemma as to how to manage the cost of treatment when they don't have sufficient funds with them.

One her visit to G. K General Hospital, Rasila got satisfactory treatment but some of the medicines prescribed were supposed to be bought from pharmacy. She was not having enough money to purchase medicine regularly, therefore she approached Adani Foundation expecting some relief to support her in completing her treatment and medicines. Her issues were immediately taken into consideration, her medicines were arranged and provide to her for free.

For the past 2 years, Rasila's medicine expenditure is taken care by Adani Foundation observing fair improvement in her condition.

Ankita Bhatt
Beauty Therapist

'Smile on my client's face is my final touchup'

Ankita bhatt hails from Bhuj, kutch. She runs her own beauty parlor for the last 5 years now. Though her beauty treatment skills were good, she used to do selective basic treatment. Ankita believes, gone are the days, where we used to think this is a small service. Now, it's a booming industry where every year there is something new and advanced techniques comes up daily in beauty industry. Keeping up with industry is not an easy task.

Ankita's beauty skills were limited and stagnant and that's when she decided to take her profession seriously and master her beauty treatment skills and understanding through proper training. Also, the Covid years hit badly to small scale, self-entrepreneurs and service providers. She decided to utilize the no-rush time in developing new skills.

In Adani Skill Development Centre, online training program was a big hit in rural areas which enable women and girls to get trained just by sitting at home without Hustle. Post covid, all trainees were invited to complete their practical training at ASDC Bhuj Centre where Ankita cleared the program with flying colours and started earning better than before giving a new look to her parlour at home.

From Failures, one only gets better for the future!

Hetal Purabiya
General Duty Assistant

"It was my mother's dream to see me working in Healthcare Industry. Even after ample efforts to get admission in GNM course to pursue dream, I didn't make it due to inadequate percentage. My confidence broke, thinking I will never get another chance to study further and will always remain a 12th pass.

I never knew any other way to fulfill my mother's dream until I learned about *GDA training course provided by Adani Skill Development Centre under DDUGKY scheme.* I decided to grab this moment to visit ASDC Centre. On my visit, I got amazed to see a hospital like setup which they call it as Practical Lab. I was well explained regarding the GDA training contents, systematic training methodology and as soon as I got to know that they are providing On the Job Training (OJT) with placement support, I got prompted to join immediately.

Unlike regular training centres, ASDC provides a lot more. *Regular guest sessions, activities and soft skills training helped us become industry ready.* Post completion of GDA course, it was the time to appear for interviews. I was confident not just because of the knowledge I gained but also because of my successful OJT period organized by ASDC. After undergoing GDA training, I became certified GDA , my lost confidence is back and I am determined to update and advance my health care skills to climb more ladders in future.

After 6 months of rigorous GDA training, OJT and placement support by ASDC, *my career kick started as Patient Care Assistant at Dr. Rashmi Shah Hospital, Kutch. I will never forget the moment when I hugged my mother and informed about my selection.*

ASDC has paved way for my successful career journey!" shares Hetal

Hiral S. Darad
Beauty Therapist

From a next-door beautician to a professional one

"I am a 12th pass self-employed Beautician; I do beauty treatments at home. With no professional degree or certification, I never got a chance to take this work to the next level. Also, self-learning was not enough, I was looking for a training program, where I could get a mentor and practical training. In my locality, there was no option to learn beautician course and its difficult to learn from random videos. I am glad that I got recommendation from my friend about Adani Skill Development Centre, where Beauty Therapist training is provided in the form of certified course along with the planned theory and practical sessions. I got so happy thinking I will finally get to attend a professional training program which will add value to my basic skills and bring me close to my dream to become expert beautician.

It gave me lot of joy to see so many young girls and women coming to ASDC Centre while undergoing training at Centre, even housewives, working women joins courses as per their interest. In many of the cases, they have developed interest and became self-employed. One of the main reasons I love ASDC Centre is to see fellow friends/batch mates and develop a network of people with similar interests in our small town. Making friends and networking with trainees is very empowering. The reason is, we got to know stories of many women and how they are utilizing skills post completion of training course.

As I was also running beauty parlour before joining course, my aim was clear that I need to master beauty treatment skills and become professional. Not just me, but even my clients have witnessed a huge transformation in my beauty treatment methodologies post training. My training journey has been a most memorable one. Post completion of the course, my income increased significantly and the number of my clients rose to a level that most days I remain busy. "

Knowledge gives Degree, Skill gives employment.

Khushal Pargadu
General Duty Assistant

"I am a resident of Naliya village, Kutch district. I completed my Graduation and also did ITI. Coming from a village location, I couldn't find enough of job opportunities with me. Most youth of our locality, move out of hometown in search of job but this is not an option for many of us because of the responsibilities.

Khushal adds, "as much as I loved attending GDA sessions, I also thoroughly enjoyed my On-the-Job experience because we got to experience working directly under expert nurses and learnt that patient care which is the most critical and crucial element in any hospital. It was an overwhelming experience on initial days of OJT when we had to deal with lot of patients, managing time and serving patients with right kind of care in case-to-case basis. *No wonder why Health Care Providers are called as 'Warriors'. OJT was no less than a Healthcare training camp where me and my fellow batch mates were prepared to become Warriors to provide best of care to the patients."*

The major impact of GDA course run by ASDC Bhuj is that many young graduates who are from Bhuj and are looking for employment are preferring to come to the Centre because they don't have to move out of Bhuj to get skilled.

ASDC has provided a platform to get skilled under various courses and supports in placement which helps local residents to stay in their hometown and generate livelihood."

Awards

Adani Foundation received CII National Award for Excellent in Water Management 2021 for 'Water Conservation Project' on 7th January 2022 under National Competition for Water Management 2021. The Award ceremony was announced by Union Jal Shakti Minister in virtual presence of dignitaries from CII and nominees from other industries.

Adani Foundation awarded for CSR in water conservation at 3rd National Water Awards from the Ministry of Jal Shakti in the category of Best Industry for CSR activities, on 29 March 2022.

The award ceremony was conducted in the presence of President Shri Ramnath Kovind, Minister of State for Jal Shakti and Food Processing Industries, Shri Gajendra Singh Shekhawat, and Minister of State for Jal Shakti and Tribal Affairs, Shri Bishwesar Tudu.

Beneficiaries Data F.Y. 2021-2022

Sr.No	Program	Direct	Indirect	Remarks
1	Education	6585	26340	Utthan , Mundra & Nakhtrana
2	AVMB-Vidhyamandir	473	2365	AVMB Students
3	Community Health-Mundra	26129	193661	Rural clinic, MHCU,Health camp, AHMUPL
4	Community Health-Bhuj	16261	65044	Medical Support , Mahiti setu, Patients Care & Co-ordination
5	AHMUPL	31291		OPD and IPD Patients
6	SLD-Women	780	3900	SHG Group & Individual Incoem Generation
7	SLD-Agri & Animal Husbandry	7398	29731	Drip,Fooder,Home bio gas,Farmers training
8	SLD -Fisherfolk	6114	5490	Education, Mangrove, Water and Livelihood
9	CRC-Gov Schemes	667	3272	Government Schmes
10	CID	138174	189617	Fishermen Amenities & Shelter & Other Amenties
11	Nakhtrana	1428	5712	Utthan, Governemnt schems
12	Tuna	6601		Fodder,Health , Pond deepning
13	Bita	2150		CID & Pond deepning
14	Lakhpat	2455		women training and palnttaion
15	ASDC	1374	6870	soft skill and DL .GDA & Online Training
	Total	247880	657166	

Summary - Budget Utilization F.Y. 2021-2022

Rs. In lacs

Sr No	Particulars	Budget 2021-22	Utilization(LE) 2021-22	% of utilization
A.	General Management and Administration	76.12	79.27	104%
B.	Education	172.05	110.38	64%
B1	Utthan-Education -Mundra & Anjar	149.51	99.88	67%
B2	Utthan : Fisherfolk	22.54	10.50	47%
C.	Community Health	330.38	323.51	98%
D.	Sustainable Livelihood Development	426.28	453.84	106%
E.	Community Infrastructure Development	141.35	130.71	92%
F.	EDM Recommended Projects	100.00	82.01	82%
G.	COVID 19 Support	25.00	22.16	89%
	Total AF CSR Budget :	1,271.18	1,201.89	95%
[I]	Adani Vidya Mandir-Bhadreshwar	189.84	117.86	62%
[II]	Project Udaan-Mundra	167.42	66.85	40%
	TOTAL Budget with AVMB & UDAAN :	1,628.45	1386.60	85%
	Project "FISH"		106.00	
	GRAND TOTAL :	1,628.45	1,492.60	92%

Media coverage


અદાણી ફાઉન્ડેશન દ્વારા નાના કપાયા ખાતે ગાઢ જંગલ ઊભું કરાશે


કચ્છ પત્રિકા

અદાણી ફાઉન્ડેશન અને તાલુકા હેલ્થ ઓફીસના સંયુક્ત ઉપક્રમે “ટી.બી.હારેગા દેશ જીતેગા” અંતર્ગત કાર્યક્રમ યોજાયો


કોરોનાકાળમાં મહિલાઓએ મેળવી રોજગારી

અદાણી સ્કિલ ડેવલપમેન્ટ દ્વારા મુંદ્રા વિસ્તારમાં તક ઊભી કરાઇ


અદાણી ફાઉન્ડેશનના પ્રયાસો રંગ લાવ્યા...

માછીમારનો દીકરો મિકેનિકલ એન્જિનીયર બન્યો, મોટી કંપનીમાં નોકરી પણ મળી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અદાણી ફાઉન્ડેશનનો મંત્ર : સેવાનું ઉત્તરદાયિત્વ

મુંદરા એસઇઝેડ ઔદ્યોગિક વિવિધતાની ઓળખ


કચ્છ પત્રિકા

“શાળા બંધ પણ શિક્ષણ નહિ”

અદાણી વિદ્યા મંદિર, ભદ્રેશ્વર દ્વારા અંતરિયાળ ગામોમાં શેરી શિક્ષણ શરુ કરાયું


કચ્છ 13

મુંદરામાં કોમ્યુનિટી રિસોર્સ સેન્ટરનો કરાયેલો પ્રારંભ

અદાણી ફાઉન્ડેશન દ્વારા બહેનો માટે કરવામાં આવતી કામગીરી


મુન્દ્રાની અદાણી હોસ્પિટલમાં કોરોના પોઝિટીવ દર્દીઓની કરાતી સેવા-ચાકરી

Media coverage

adani Foundation

અદાણી ફાઉન્ડેશનનો મંત્ર : સેવાનું ઉત્તરદાયિત્વ

મુંદરા એસઇઝેડ ઔદ્યોગિક વિવિધતાની ઓળખ

પ્રજાલક્ષી કાર્યોમાં અદાણી ફાઉન્ડેશન હંમેશાં અગ્રેસર

માનવ કલ્યાણ ટ્રસ્ટ સંચાલિત સાર્વજનિક સ્મશાનગૃહમાં શેડનું ભૂમિપૂજન : માર્ગમાં પેવર બ્લોક થશે

મુંદરાના માનવ કલ્યાણ ટ્રસ્ટ સંચાલિત સાર્વજનિક સ્મશાનગૃહ

ભુજ - રવિવાર, તા. ૦૨-૦૫-

કોરોના સામેના જંગમાં અદાણી ગ્રુપના પ્રયાસો

મુંદરામાં કોવિડ હોસ્પિટલ વિકસાવાઈ રહી છે, સીટી સ્કેન મશીન પણ સ્થપાશે : ઓક્સિજનની કટોકટી હળવી કરવા અનેક દેશોથી પુરવઠો મેળવવા ચક્રો ગતિમાન

વિશ્વ દિવ્યાંગ દિને અદાણી ફાઉન્ડેશન દ્વારા

મુન્દ્રામાં ૧૪ દિવ્યાંગને રોજગારી પૂરી પાડી દિવ્યાંગ દિવસની ઉજવણી કરાઈ

કચ્છ પત્રિકા

અદાણી ફાઉન્ડેશન અને તાલુકા હેલ્થ ઓફીસના સંયુક્ત ઉપક્રમે "ટી.બી.હારેગા દેશ જીતેગા" અંતર્ગત કાર્યક્રમ યોજાયો

અદાણી ફાઉન્ડેશનના પશુ વિકાસ કાર્યક્રમ અંતર્ગત પશુઓને રસીકરણ, કૃમિનાશક દવા તથા સારવાર

૧૨ ગામોના ૧૮૦૦૦ થી ૨૦૦૦૦ નાના અને મોટા પશુઓને આવરી લેવાના લક્ષ્યાંક સાથે શરૂઆત

'જોય ઓફ ગિવિંગ' અંતર્ગત ૭૫૦ જરૂરતમંદોને

અદાણી ગ્રૂપના કર્મચારીઓ દ્વારા કપડાં અને રમકડાંનું વિતરણ કરાયું

અદાણી ફાઉન્ડેશનને CSR પ્રવૃત્તિ માટે એવોર્ડ

કેન્દ્રીય જળ શક્તિ મંત્રાલય દ્વારા જાહેર કરાયેલા વિવિધ એવોર્ડ પૈકી ગુજરાત અદાણી ફાઉન્ડેશનને બેસ્ટ ઈન્ડસ્ટ્રી ફોર સીએસઆર એક્ટિવિટી માટે પ્રથમ નંબરના એવોર્ડની જાહેરાત કરાઈ છે. જળશક્તિ મંત્રાલય દ્વારા 11 વિવિધ શ્રેણીઓમાં રાજ્યો, સંસ્થાઓ અને વ્યક્તિઓ વગેરેને પુરસ્કાર અપાય છે.

Thank You