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

Submitted By:

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

PERIOD: October'2020 – March'2021

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Adani Power (Mundra) Limited

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

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Compliance status on Environment Clearance

For 660 MW (2x330) TPP Phase – I

Vide letter No. J-13011/7/2007-IA-II (T) dated 13.08.2007

Sr. No.	Conditions	Compliance 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 by Adani Power Limited 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.
(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.	Subsequent to NIO's 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.	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 MoEF&CC's

Sr. No.	Conditions	Compliance Status
		Notification date 31st March 2021, Mundra TPP is falling under Category "C" Non- retiring TPPs and the timelines for compliance of SO2 emission is up to December 2024. Accordingly the work is under progress for compliance as per CPCB direction.
(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)	Rain water harvesting should be adopted. Central Groundwater Authority/Board shall be consulted for finalization of appropriate rain water harvesting structure within a period of three months from the date of clearance	Rain water 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, SO2, NOX has 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 October' 2021 to March'2021 is enclosed as **Annexure VIII**

Sr. No.	Conditions	Compliance Status
(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 IX**
(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 139.46 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 was 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, 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.

Sr. No.	Conditions	Compliance Status
		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 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'2020 to September'2020 had been submitted vide letter no. APL/EMD/EC/MoEFCC/209/11/20 Dated: 11.11.2020.

Sr. No.	Conditions	Compliance Status
(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 '2020 to March '2021 (FY 2020-21) is enclosed as **Annexure X**
(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 Authority

Adani Power (Mundra) Limited

Compliance status on Environment Clearance

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

Vide letter No. J-13011/1/2008-IA-II (T) dated 21.10.2008

Sr. No.	Conditions	Compliance 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 (by consultant) marine monitoring is also being carried out, monitoring report enclosed for the period of October '2020 to March '2021 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

Sr. No.	Conditions	Compliance Status
		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 meteorological 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. 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

Sr. No.	Conditions	Compliance Status
		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 MoEF&CC's Notification date 31st March 2021, Mundra TPP is falling under Category "C" Non- retiring TPPs and the timelines for compliance of SO2 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)	Rain water 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' 2020 to March' 2021 is enclosed **Annexure VIII**

Sr. No.	Conditions	Compliance Status
(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 the 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 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/ear muffs 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.	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 ear-muff and ear plug to all employees & workers. Occupational Health & Safety Management System as ISO ISO 45001:2018 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 IX.**
(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 139.46 Ha. (Out of total 452 Ha Land for all three phases)

Sr. No.	Conditions	Compliance Status
		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 Environment and Forests http://envfor.nic.in	Complied
(xxvi)	A separate environment management cell with qualified staff shall be set up	We have established separate environmental monitoring cell with well-qualified staff to

Sr. No.	Conditions	Compliance Status
	for implementation of the stipulated environment safe guards.	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 implemented.**
(xxvii)	Half yearly on the status of implementation of stipulated condition and environmental safe guards shall be submitted to this Ministry/Regional office /CPCB/SPCB.	Six monthly compliance report accordance to the Environmental clearance granted by MoEF&CC being submitted to MoEF&CC, CPCB & GPCB. Last compliance report was submitted for the period of April'2020 to September'2020 had been submitted vide letter no. APL/EMD/EC/MoEFCC/209/11/20 Dated: 11.11.2020.
(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 October'2020 to March'2021 (F.Y. 2020-21) is enclosed as **Annexure X**
(xxx)	The project authorities shall inform the Regional office as well as the Ministry regarding the date of financial closure	Complied

Sr. No.	Conditions	Compliance Status
	and final approval of the project by the concerned authorities and the dates of start of land development work and commissioning of 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

Compliance status on Environment Clearance

For 1980 MW (3x660) TPP Phase – III

Vide letter No. J-13012/126/2008-IA.II (T) dated 20.05.2010

Sr. No.	Specific Conditions	Compliance 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 and 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 also being monitored on regular basis. Marine 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 implemented.**
(vii)	The project proponent shall not be hamper 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.	The power plant is located at a site, which is away from the fishing areas. Adani Power (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 XI**
(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 XI**
(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 XI**
(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 October 2020 to March 2021 is enclosed as **Annexure VIII**

(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 nearby area.
(xxii)	There should not be any contamination of soil, ground and surface waters (Canals & 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.	Being complied. The Sea water is used within the plant premises only and in closed circuit. There is no 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	Being complied. Green belt / plantation developed in 139.45 Ha (Out of total 452 Ha Land for all three phases). Afforestation has been undertaken by APSEZL and Adani Foundation. Green belt / plantation details are enclosed as **Annexure VI**

	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.	
(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. Mundra TPP has already established Horticulture Department with all requisite facility, 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 waste water 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 deep sea to avoid aggregation of fish. The brine that comes out from desalinization plants should not be discharged into sea.	The waste water is treated and disposed off through Outfall Channel, as recommended by NIO and approved by MoEF&CC.
(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 waste water 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 with in 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 XI**.
(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 for FY 2020-21 **i**s enclosed as **Annexure XI**
(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 for CSR activities. Details of the activities to be undertaken shall be submitted within one month along with road map for implementation.	Complied. A separate budget earmarked for CSR activities. CSR study report already submitted to ministry. CSR activities being carried out by Adani Foundation. Expenditure details from October'2020 to March'2021 (F.Y.2020-21) is enclosed as **Annexure X**

(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 XI**
(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 has carried out the Social audit. Last Social Audit Report has been submitted in six monthly compliance report April'2015 to September'2015.
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. Rain water 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 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.	Proper firefighting and fire hydrant system has 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 was 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	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 checkup 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

	record and for treatment for any hearing loss including shifting to non noisy/less noisy areas.	**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 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.	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 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 housing facilities has been 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 concerned Panchayat, Zila Parisad /Municipal Corporation, urban local Body and the	Complied.

	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.	
(xii)	A separate Environment Management cell with qualified staff shall be set up for implementation of the stipulated environment safe guards.	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 implemented.**
(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' 20 to September'20 had been submitted vide letter no. APL/EMD/EC/MoEFCC/209/11/20 Dated: 11.11.2020.
(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	Being complied, Regular environment statement is being submitted to the Gujarat Pollution Control Board (GPCB).

	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.	
(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 up load 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	Being Complied. Separate funds allocated for environmental protection measures.

	wise breakup. 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 should be reported to the Ministry.	Expenditures details F.Y. 2020-21 is enclosed as **Annexure X**
(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 is being extended to mentioned authority always.

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ENVIRONMENTAL MONITORING REPORT

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

Period: October 2020 - December 2020

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 2020 - December 2020						
Project Number	03	**Report No.**	UERL/ENV/OCT/ 10-12 / 2020	**Version**	1	**Released**	January 2021
Project Coordinator	Mr. Bhavin Patel						
Prepared By	Miss. Shweta A. Rana						
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FOR
UniStar Environment and
Research Labs Pvt. Ltd.

Mr. Jaivik Tandel
(Authorized By)

adani

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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 2020-December 2020.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 2020 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.

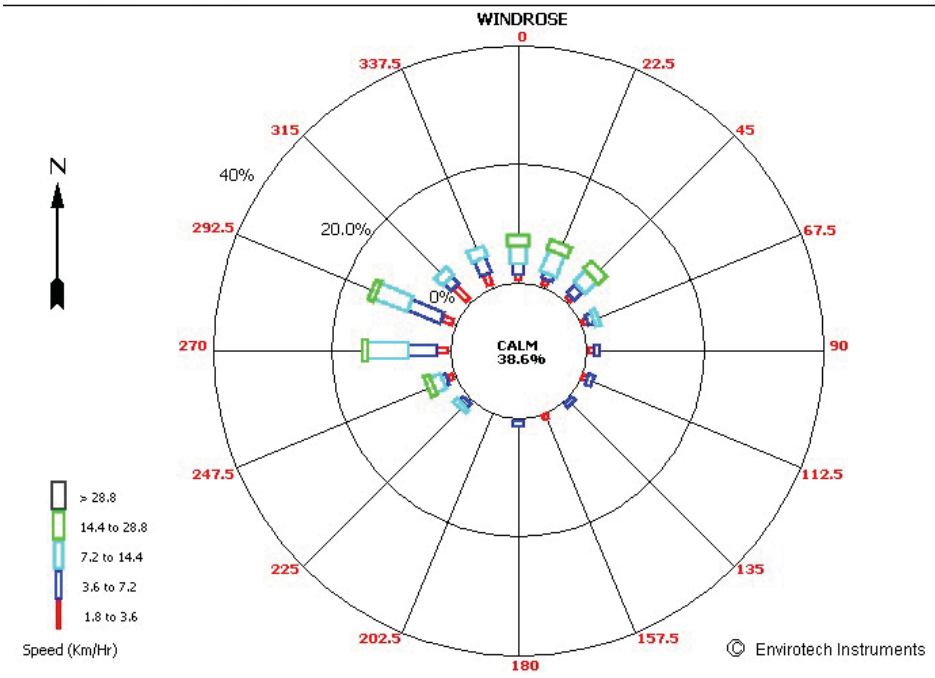
1.5.1 Wind Rose Diagram

Project	:	**Adani Power (Mundra) Limited (APMuL)**	**Period**	**:**	October 2020 to December 2020
Location	:	**Village – Tunda, Dist. - Kutch**			
October 2020					
Wind Direction			W		
Average Wind Speed			5.1 km/hr		
November 2020					
Wind Direction			NNE		
Average Wind Speed			5.1km/hr		
December 2020					
Wind Direction			NNE		
Average Wind Speed			3.3 km/hr		

ADANI POWER (MUNDRA) LIMITED – MUNDRA WINDROSE FOR THE SEASON OF Oct. to Dec. 2020

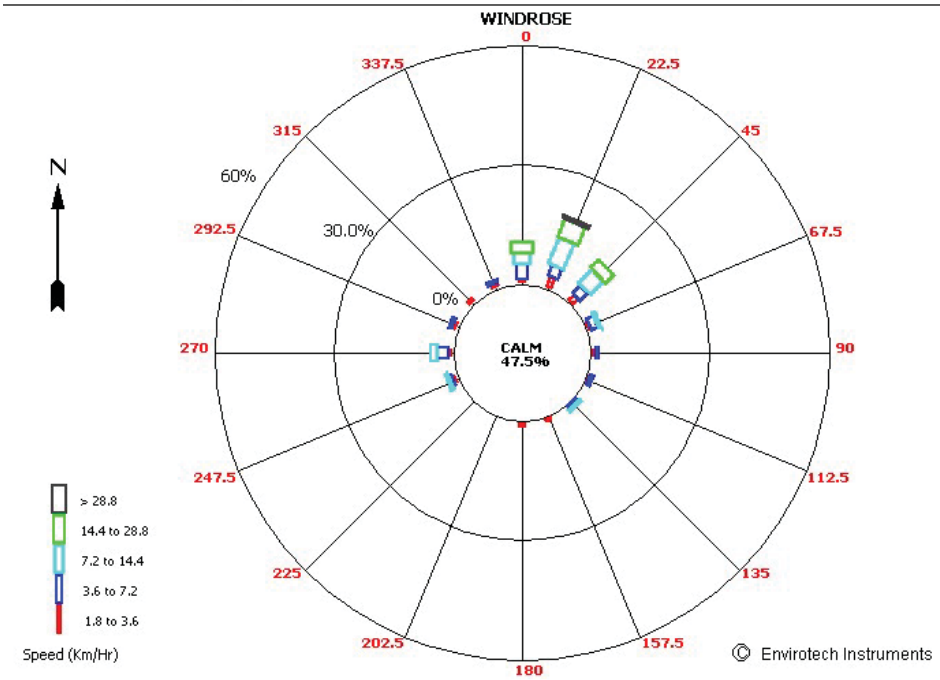
Time : 00:00 - 23:00
Date : 01/10/20 - 31/10/20

ADANI POWER (MUNDRA) LIMITED



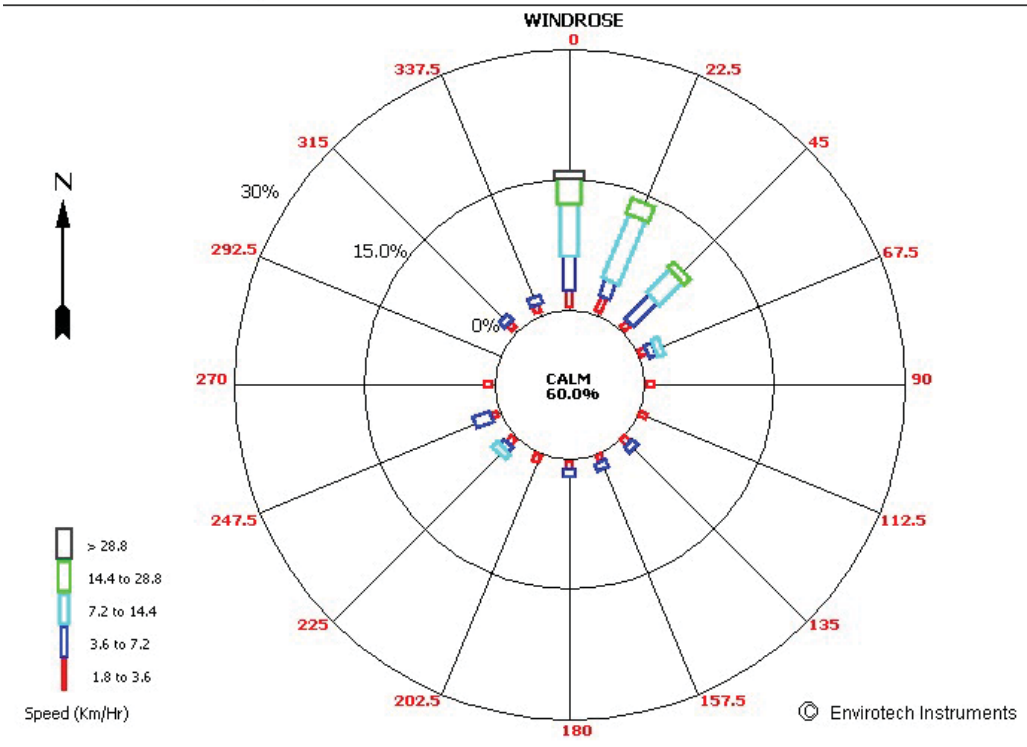
Time : 00:00 - 23:00
Date : 02/11/20 - 30/11/20

Adani Power Mundra



Time : 00:00 - 23:00
Date : 01/12/20 - 31/12/20

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)

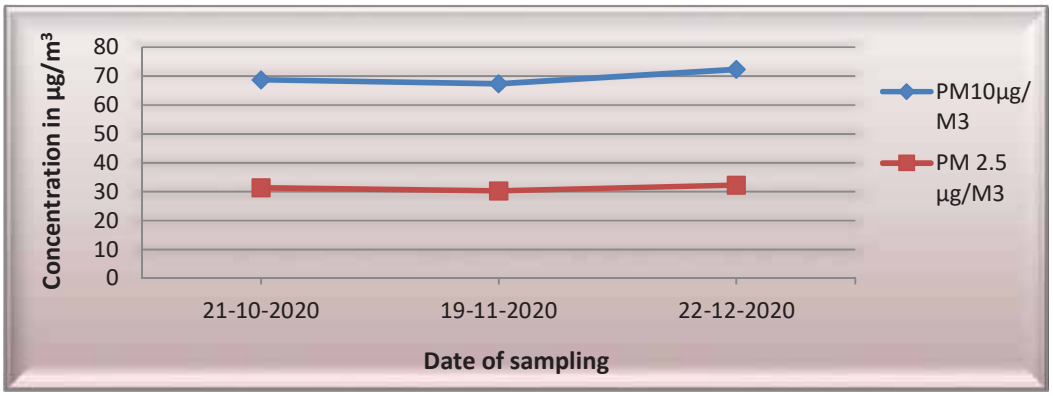
3.1.2 Location: Nr.20 MLD Plant

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 (Oct.2020- Dec.2020) are as follows:

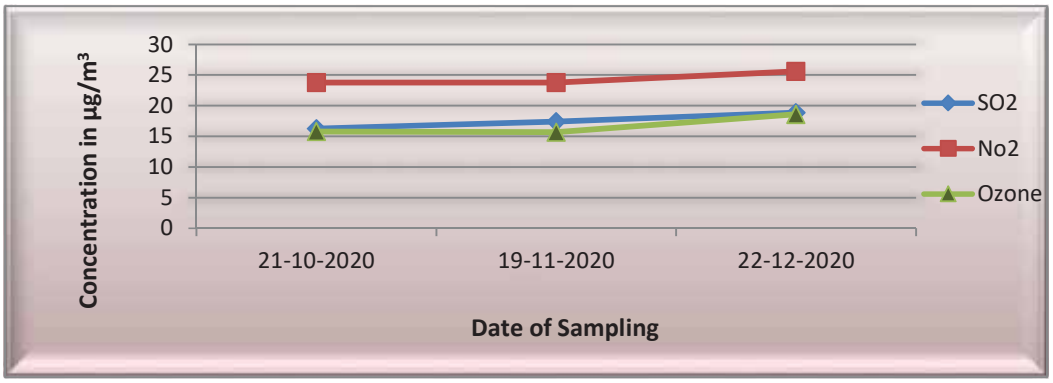
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	72.3	32.3	18.9	25.6	18.6
Minimum Value	67.3	30.3	16.3	23.8	15.7
Average Value	69.4	31.3	17.5	24.4	16.7
Standard Deviation	2.6	1.0	1.3	1.0	1.6
Permissible Limits	**100**	**60**	**80**	**80**	**100**

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



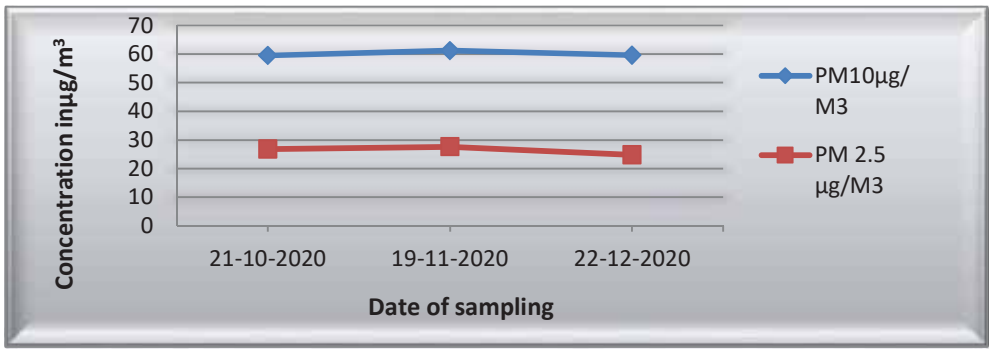
3.1.3 Location: Nr. Shantiniketan-1

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.2020- Dec.2020) are as follows

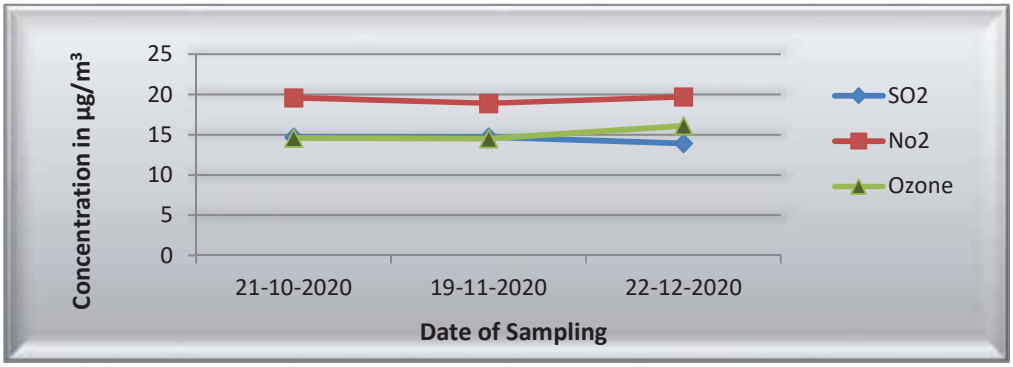
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	61.2	27.6	14.7	19.7	16.1
Minimum Value	59.5	24.8	13.9	18.9	14.5
Average Value	60.1	26.4	14.4	19.4	15.0
Standard Deviation	1.0	1.4	0.5	0.4	0.8
Permissible Limits	**100**	**60**	**80**	**80**	**100**

Units: µg/m^3

Graph 3: Particulate Matter Level Nr. Shantiniketan-1



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



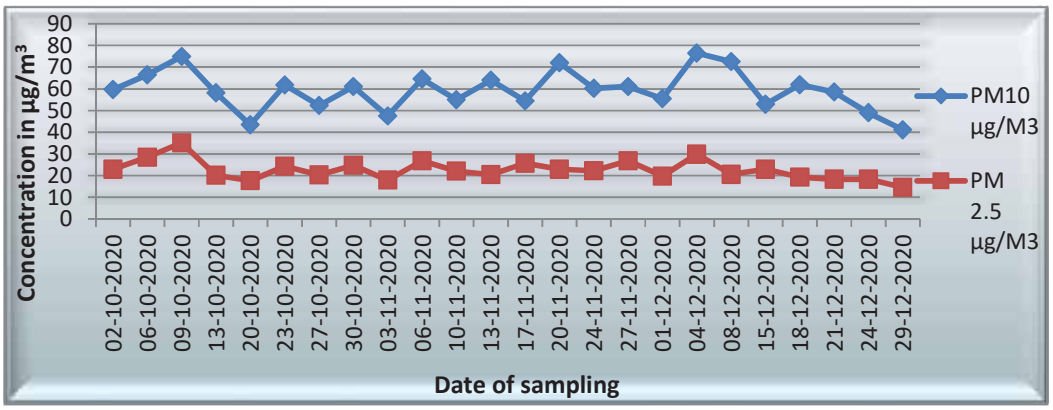
3.1.4 Location: Kandagara Village

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 1.5 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.2020- Dec.2020) are as follows.

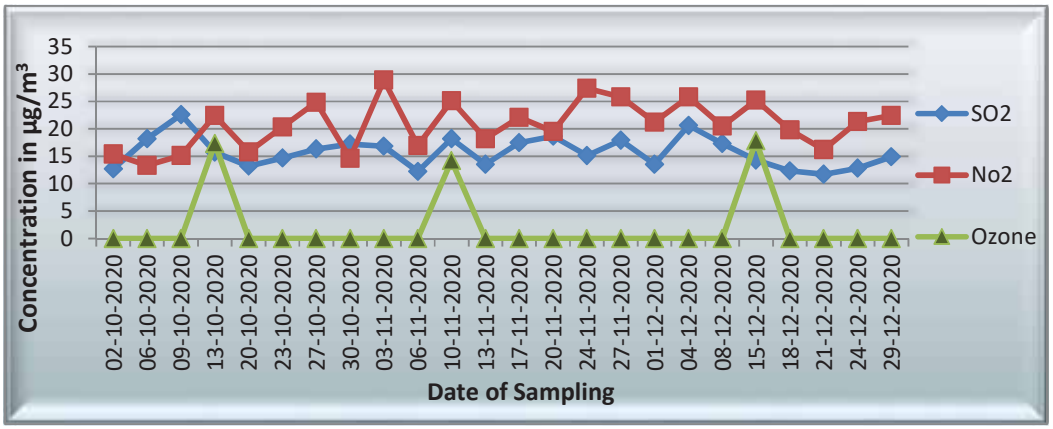
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	76.5	35.1	22.6	28.9	17.8
Minimum Value	41.1	14.6	11.7	13.3	14.2
Average Value	59.4	22.6	15.7	20.8	16.4
Standard Deviation	9.3	4.6	2.8	4.4	1.9
Permissible Limits	**100**	**60**	**80**	**80**	**100**

Units: µg/m^3

Graph 5: Particulate Matter Level Kandagara Village



Graph 6 : SO2, NO2 and O_3 Level Kandagara Village



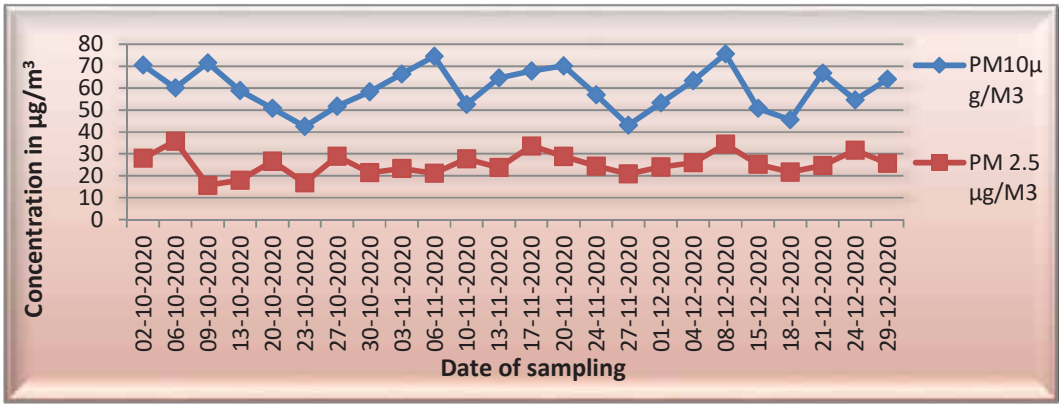
3.1.5 Location: Siracha Village

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 (Oct.2020- Dec.2020) are as follows.

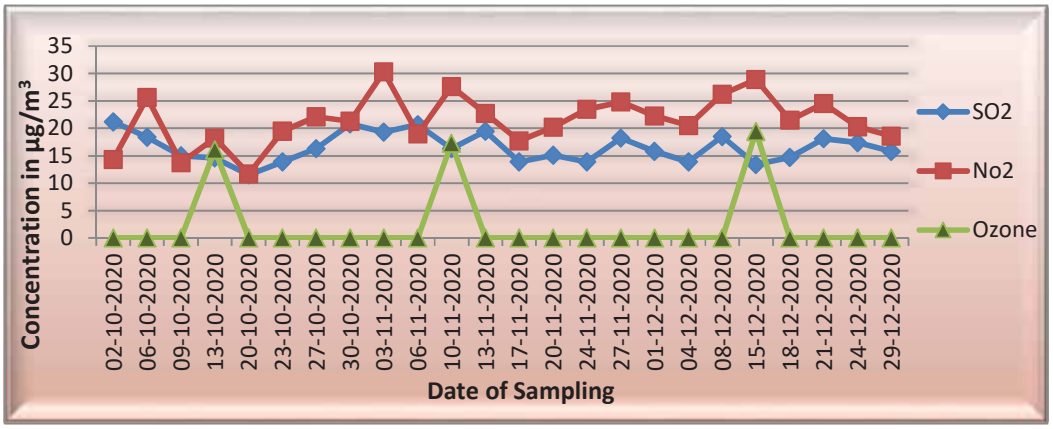
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	75.7	35.9	21.2	30.3	19.4
Minimum Value	42.5	15.7	11.5	11.7	16.1
Average Value	59.8	25.4	16.5	21.5	17.6
Standard Deviation	9.7	5.3	2.7	4.6	1.6
Permissible Limits	**100**	**60**	**80**	**80**	**100**

Units: µg/m^3

Graph 7 : Particulate Matter Level Siracha Village



Graph 8 : SO_2, NO_2 and O_3 Level Siracha Village



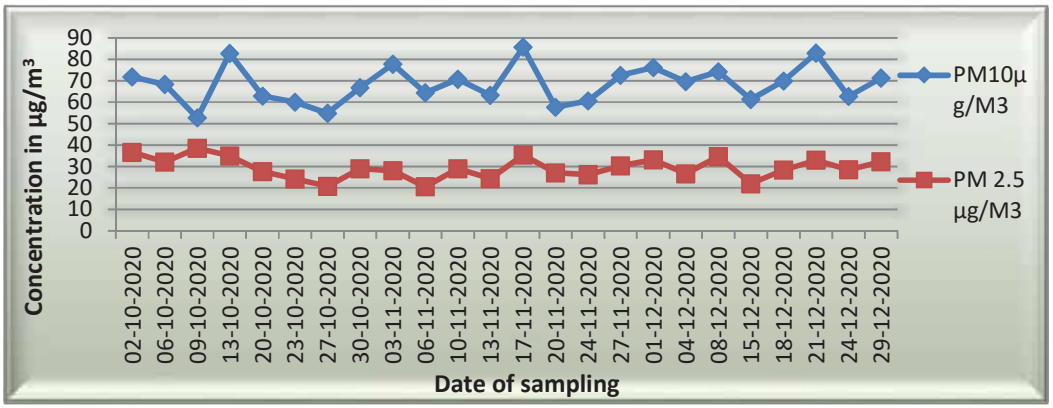
3.1.6 Location: Wandh Village

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.2020- Dec.2020) are as follows.

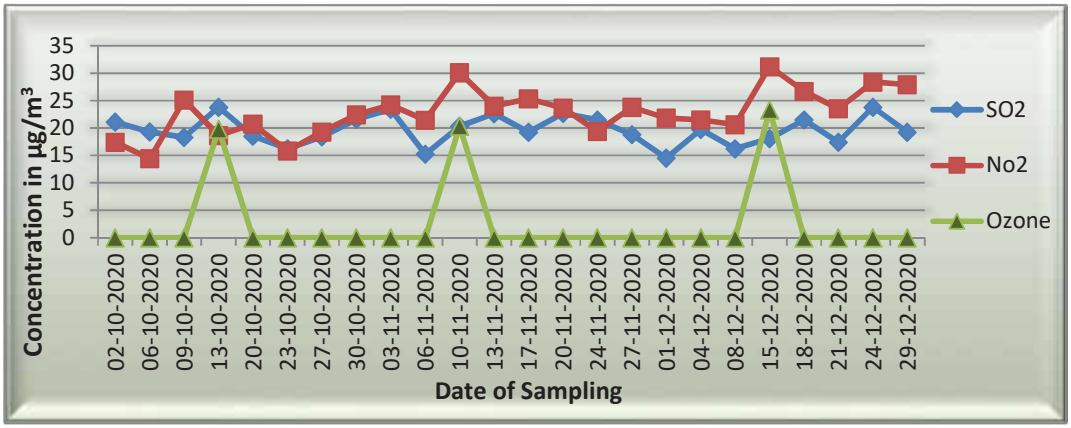
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	85.7	38.6	23.8	31.2	23.3
Minimum Value	52.7	20.6	14.5	14.4	23.3
Average Value	68.4	29.3	19.6	22.8	22
Standard Deviation	8.8	4.9	2.7	4.3	1.7
Permissible Limits	**100**	**60**	**80**	**80**	**100**

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 - 2020			November- 2020			December - 2020		
	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	**13.10.20**	17.3	BDL	**10.11.20**	14.2	BDL	**15.12.20**	17.8	BDL
Village Wandh	**13.10.20**	19.8	BDL	**10.11.20**	20.3	BDL	**15.12.20**	23.3	BDL
Village Siracha	**13.10.20**	16.1	BDL	**10.11.20**	17.3	BDL	**15.12.20**	19.4	BDL
Nr. 20 MLD Plant	**21.10.20**	15.8	BDL	**19.11.20**	15.7	BDL	**22.12.20**	18.6	BDL
Nr. Shantiniketan-1	**21.10.20**	14.6	BDL	**19.11.20**	14.5	BDL	**22.12.20**	16.1	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

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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
6.10.2020	Boiler (Unit - 1)	32.6	562.2	263.1
5.11.2020	Boiler (Unit - 1)	33.2	534.2	241.3
8.12.2020	Boiler (Unit - 1)	33.8	523.6	240.1
6.10.2020	Boiler (Unit - 2)	34.8	548.7	272.4
5.11.2020	Boiler (Unit - 2)	34.8	562.5	232.6
8.12.2020	Boiler (Unit - 2)	32.1	572.4	231.2
7.10.2020	Boiler (Unit - 3)	37.4	540.9	266.3
6.11.2020	Boiler (Unit - 3)	31.3	555.8	262.3
14.12.2020	Boiler (Unit - 3)	29.6	554.6	265.6
7.10.2020	Boiler (Unit - 4)	38.2	566.4	261.8
6.11.2020	Boiler (Unit - 4)	35.8	567.5	233.2
14.12.2020	Boiler (Unit - 4)	32.1	568.4	248.9
23.10.2020	Boiler (Unit - 5)	40.1	518.1	290.7
7.11.2020	Boiler (Unit - 5)	40.2	496.5	284.4
15.12.2020	Boiler (Unit - 5)	36.8	492.6	274.1
23.10.2020	Boiler (Unit - 6)	33.6	488.9	273.3
7.11.2020	Boiler (Unit - 6)	38	488.7	276.3
15.12.2020	Boiler (Unit - 6)	37.4	476.3	260.2
12.10.2020	Boiler (Unit - 7)	38.2	178.4	269.6
10.11.2020	Boiler (Unit - 7)	37.2	172.3	261.7
17.12.2020	Boiler (Unit - 7)	40	174.8	265.4
12.10.2020	Boiler (Unit - 8)	35.2	164.9	262.2
10.11.2020	Boiler (Unit - 8)	34.1	161.3	263.8
28.12.2020	Boiler (Unit -8)	33.3	156.4	251.1
12.10.2020	Boiler (Unit - 9)	39.6	171.8	289.3
10.11.2020	Boiler (Unit - 9)	33.3	158.4	270.3
28.12.2020	Boiler (Unit - 9)	34.6	159.7	256.7
Permissible Limits		**50**	**<500 MWH-600 >500 MWH-200**	**300**

3.3 Water Quality Monitoring

3.3.1 Location: Tunda Village Water Sample **DATE: 21/12/2020**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.43	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	118.6	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	25.6	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	16.3	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1276	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	323.9	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	425.2	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	149.2	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	0.23	0.2 mg/lit.	1.0 mg/lit.
18	Fluoride as F	mg/L	0.58	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

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3.3.2 Location: Kandagara Village Water Sample **DATE: 21/12/2020**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.51	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	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	31.8	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	19	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1252	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	379.6	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	415.7	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	125.1	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	0.24	0.2 mg/lit.	1.0 mg/lit.
18	Fluoride as F	mg/L	0.51	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

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3.3.3Location: Siracha Village Water Sample **DATE: 21/12/2020**

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	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	186.9	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	36.2	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	23.5	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1222	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	262.7	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	365.4	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	137.3	200 mg/lit.	400 mg/lit.
13	Nitrate as NO_3	mg/L	1.9	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	0.23	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

3.3.4 Location: Navinal Village Water Sample **DATE: 21/12/2020**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.56	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	159.6	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	32.8	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	18.9	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1132	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	247.2	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	396.8	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	134.5	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	0.25	0.2 mg/lit.	1.0 mg/lit.
18	Fluoride as F	mg/L	0.52	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

3.3.5Location: Desalpur Village Water Sample **DATE: 21/12/2020**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.63	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	139.6	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	26.3	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	19.4	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1106	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	340.2	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	374.1	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	115.5	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	0.24	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)	08	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		
			13/10/2020	05/11/2020	03/12/2020
1	pH @ 25	--	7.94	7.85	7.86
2	Temperature	^{0}C (Intake)	29.5	29.5	25.5
		^{0}C (Outfall)	32.0	32.5	28.5
		^{0}C (Differential)	2.5	3.0	3.0
3	Color	Pt. CO. Scale	10	10	10
4	Total Suspended Solids	mg/L	28	36	32
5	Oil & Grease	mg/L	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)
6	Ammonical Nitrogen	mg/L	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)
7	Sulphide as S-2	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
8	Total Chromium	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
9	Hexavalent Chromium as Cr+6	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
10	Phosphate as PO_4	mg/L	0.25	0.29	0.23
11	Lead as Pb	mg/L	0.018	0.012	0.009
12	Copper as Cu	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
13	Zinc as Zn	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
14	Iron (as Fe)	mg/L	0.114	0.107	0.113
15	Chemical Oxygen Demand(COD)	mg/L	42.4	38.2	33.8
16	Biochemical Oxygen Demand (BOD)	mg/L	13	12	12

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

3.4.2 Location: STP Outlet Water Sample;

Sr. No.	Parameter	Unit	SPCB Limit	Date of sampling		
				13/10/2020	05/11/2020	22/12/2020
1	pH @ 25 ° C	--	**6.5-8.5**	7.52	7.31	7.42
2	Total Suspended Solids	mg/L	**30**	24	20	16
3	Residual Chlorine	mg/L	**0.5 Min.**	0.62	0.71	0.63
4	Biochemical Oxygen Demand (BOD)	mg/L	**20**	14	16	12
5	Fecal Coliform	CFU/100ml	**<1000**	42	46	42

3.4.3 Location: ETP Outlet Water Sample;

S.N	Parameter	Unit	SPCB Limit	Date of sampling		
				13/10/2020	05/11/2020	22/12/2020
1	pH @ 25	--	**6.5 – 8.5**	7.41	7.56	7.67
2	Temperature	° C	**40 Max.**	30	31	29
3	Color	Pt. CO. Scale	**100 Max.**	20	20	20
4	Total Suspended Solids	mg/L	**100 Max.**	12	16	14
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.**	52.6	59.1	52.2
7	Biochemical Oxygen Demand (BOD)	mg/L	**30 Max.**	16	18	16
8	Chloride as Cl^-	mg/L	**600 Max.**	530.2	485.2	466.2
9	Total Dissolved Solids	mg/L	**2100 Max.**	1602	1710	1644
10	Sulphate as SO_4	mg/L	**1000 Max.**	140.5	125.1	103.3
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.**	55.6	54.2	52.1
13	Sodium Absorption Ratio(SAR)	mg/L	**26 Max.**	2.28	2.45	2.37
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	0.39	0.28
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: 05/11/2020**

Sr.No.	Parameter	Unit	Results			
			Borewell-1	Borewell-2	Borewell-3	Borewell-4
1	pH @ 25 ° C	-	7.63	7.49	7.47	7.72
2	Conductivity (µS)	-	14710	16460	14770	15660
3	Chloride as Cl^-	mg/L	4678.3	4296.3	4325.6	4526.3
4	Salinity (ppt)	mg/L	8.4	7.7	7.8	8.0
5	Total Dissolved Solids	mg/L	9864	11024	9896	10326
6	Carbonate as CaCO3	mg/L	23.1	26.7	23.1	27.3
7	Bicarbonate as CaCO3	mg/L	218.5	178.3	181.1	159.3
8	Mercury as Hg	mg/L	BDL(MDL:0.001)	BDL(MDL:0.001)	BDL(MDL:0.001)	BDL(MDL:0.001)
9	Arsenic as As	mg/L	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)
10	Lead as Pb	mg/L	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)
11	Chromium as Cr	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
12	Cadmium as Cd	mg/L	BDL(MDL:0.03)	BDL(MDL:0.03)	BDL(MDL:0.03)	BDL(MDL:0.03)
13	Iron (as Fe)	mg/L	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)
14	Zinc (as Zn)	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
15	Total Alkalinity	mg/L	456.3	389.3	389.2	453.2
16	Calcium as Ca	mg/L	338.1	332.1	281.3	346.3
17	Magnesium as Mg	mg/L	237.5	192.5	149.3	186.2
18	Sodium as Na	mg/L	1478	1906	1235	1510
19	Potassium as K	mg/L	83.2	117.2	65.2	89.3
20	Sulphate as SO4-2	mg/L	593.2	744.0	567.3	693.3
21	Nitrate as NO3	mg/L	22.1	26.3	20.5	26.5
22	Phosphate as PO_4	mg/L	2.8	3.2	2.10	2.9
23	Barium as Ba	mg/L	N.D.	N.D.	N.D.	N.D.
24	Fluoride as F	mg/L	2.45	2.30	1.95	2.35
25	Cobalt as Co	mg/L	N.D.	N.D.	N.D.	N.D.
26	Copper as Cu	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
27	Manganese as Mn	mg/L	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)
28	Nickel as Ni	mg/L	BDL(MDL:0.02)	BDL(MDL:0.02)	BDL(MDL:0.02)	BDL(MDL:0.02)

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	Unit-4
Date of Sampling ⟹				03/12/2020	03/12/2020	03/12/2020	03/12/2020
1	pH @ 25 ° C	--	-	7.75	7.82	8.31	7.65
2	Free available Chlorine	° C	Min. 0.5	0.75	0.67	0.77	0.68
3	Zinc as Zn	Pt. CO. Scale	1.0	BDL(MDL:0.05)	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)	BDL(MDL:0.05)
5	Total Chromium as Cr	mg/L	0.2	0.053	0.061	0.055	0.063
6	Phosphate as P	mg/L	5.0	0.31	0.33	0.47	0.40

S.No.	Parameter	Unit	Limit	Results				
				Unit-5	Unit-6	Unit-7	Unit-8	Unit-9
Date of Sampling ⟹				03/12/2020	03/12/2020	03/12/2020	03/12/2020	03/12/2020
1	pH @ 25 ° C	--	-	7.69	7.79	7.80	7.78	8.08
2	Free available Chlorine	° C	Min. 0.5	0.66	0.65	0.66	0.75	0.69
3	Zinc as Zn	Pt. CO. Scale	1.0	BDL(MDL:0.05)	BDL(MDL:0.05)	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)	BDL(MDL:0.05)	BDL(MDL:0.05)
5	Total Chromium as Cr	mg/L	0.2	0.059	0.052	0.054	0.062	0.053
6	Phosphate as P	mg/L	5.0	0.49	0.50	0.41	0.36	0.48

3.4.6 Location: Condensate Cooling Tower Water Sample

S.No.	Parameter	Unit	Limit	Results			
				Unit-1	Unit-2	Unit-3	Unit-4
Date of Sampling ⟹				03/12/2020	03/12/2020	03/12/2020	03/12/2020
1	pH @ 25 ° C	--	**6.5 to 8.5**	7.81	7.83	7.87	7.87
2	Temperature ^{0}C (Intake)	^{0}C	--	27.5	27.5	27.5	28.0
	Temperature ^{0}C (Outlet)	^{0}C	--	29.5	30.0	29.5	30.5
	Temperature ^{0}C (Differential)	^{0}C	**7**	2.0	2.5	2.0	2.5
3	Free available Chlorine	mg/L	**Min 0.5**	0.77	0.82	0.79	0.75

S.No.	Parameter	Unit	Limit	Results				
				Unit-5	Unit-6	Unit-7	Unit-8	Unit-9
Date of Sampling ⟹				03/12/2020	03/12/2020	03/12/2020	03/12/2020	03/12/2020
1	pH @ 25 ° C	--	**6.5 to 8.5**	7.81	7.80	8.10	7.81	8.10
2	Temperature ^{0}C (Intake)	^{0}C	--	27.5	27.5	27.5	28.0	28.0
	Temperature ^{0}C (Outlet)	^{0}C	--	29.5	29.5	30.0	30.5	30.5
	Temperature ^{0}C (Differential)	^{0}C	**7**	2.0	2.0	2.5	2.5	2.5
3	Free available Chlorine	mg/L	**Min 0.5**	0.76	0.78	0.84	0.84	0.81

3.4.7 Location: Boiler Blow Down Water Sample **DATE: 03/12/2020**

Sr. No.	Parameter	Unit	Limit	Results			
				Unit -1	Unit -2	Unit -3	Unit -4
1	Total Suspended Solids	mg/L	**100**	BDL(MDL:4.0)	BDL(MDL:4.0)	BDL(MDL:4.0)	BDL(MDL:4.0)
2	Oil & Grease	mg/L	**10**	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)
3	Total Copper as Cu	mg/L	**1.0**	0.010	0.013	0.007	0.006
4	Total Iron (as Fe)	mg/L	**1.0**	0.017	0.011	0.012	0.010

3.5 Soil Quality Monitoring: Date: 21/12/2020

Locations of soil sampling ⇨			Kandagara	Tunda	Desalpur	Siracha	Navinal
Sr. No.	Parameter	Unit	Results				
1	Magnesium as Mg	%	0.0051	0.0040	0.0059	0.0051	0.0097
2	Molybdenum as Mo	%	N.D.	N.D.	N.D.	N.D.	N.D.
3	Phosphorous as P	%	0.304	0.3391	0.2203	0.2823	0.2324
4	Calcium as Ca	%	0.037	0.026	0.017	0.0352	0.0267
5	Zinc as Zn	%	0.005	0.0018	0.0025	0.0026	0.0024
6	Manganese as Mn	%	0.018	0.025	0.0281	0.029	0.0241
7	Potassium as K	%	0.0049	0.0040	0.0034	0.0024	0.0035
8	Nitrogen as N	%	0.0064	0.0079	0.0083	0.0067	0.0089
9	Iron as Fe	%	0.3214	0.484	0.4411	0.7623	1.1253
10	Copper as Cu	%	0.0008	0.0006	0.0006	0.0003	0.0003
11	Boron as B	%	N.D.	N.D.	N.D.	N.D.	N.D.
12	Sulphur	%	0.0052	0.0081	0.0050	0.0081	0.0081
13	Chlorides as Cl	%	0.0051	0.0158	0.0148	0.0581	0.040

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: 13-14.10.2020
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	10:35 am - 13:30 pm	62.9	22:55 pm -01:10 am	58.8
2.	Nr. 20 MLD Plant		63.6		58.5
3.	Nr. Pump House		63.1		56.9
4.	Nr. Coal Handling plant		67.5		61.6
5.	Nr. Gate No.4		58.9		57.8
6.	Nr. Integrated Ash Silo		68.5		62.3
7.	Nr. Main Gate		63.8		60.7
8.	Nr. APCH Building		59.0		57.2
9.	Nr. Shantiniketan-I		58.1		57.7
10.	Nr. OHC Building		62.5		58.5

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

Date of Monitoring: 02-03.11.2020
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	11:30 am - 13:50 pm	62.3	22:40 pm -00:40 am	60.4
2.	Nr. 20 MLD Plant		63.2		61.3
3.	Nr. Pump House		61.9		60.7
4.	Nr. Coal Handling plant		65.8		61.7
5.	Nr. Gate No.4		59.2		58.9
6.	Nr. Integrated Ash Silo		68.5		64.0
7.	Nr. Main Gate		63.1		60.6
8.	Nr. APCH Building		58.4		58.0
9.	Nr. Shantiniketan-I		59.8		57.5
10.	Nr. OHC Building		63.9		60.5

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

Date of Monitoring: 22-23.12.2020

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 - 13:30 pm	63.2	22:00 pm -00:15 am	61.1
2.	Nr. 20 MLD Plant		62.5		59.2
3.	Nr. Pump House		63.6		58.0
4.	Nr. Coal Handling plant		64.8		60.4
5.	Nr. Gate No.4		57.0		55.1
6.	Nr. Integrated Ash Silo		66.8		60.8
7.	Nr. Main Gate		62.9		59.8
8.	Nr. APCH Building		60.7		59.2
9.	Nr. Shantiniketan-I		59.4		56.3
10.	Nr. OHC Building		60.9		58.8

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

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adani

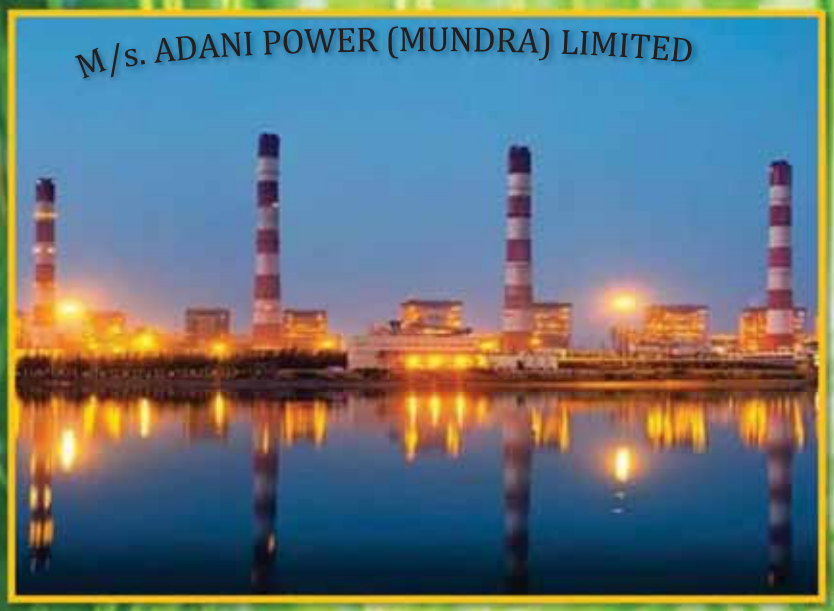
ENVIRONMENTAL MONITORING REPORT

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

Period: January 2021- March 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 January 2021- March 2021						
Project Number	03	**Report No.**	UERL/ENV/JAN/ 01-03 / 2021	**Version**	1	**Released**	April 2021
Project Coordinator	Mr. Bhavin Patel						
Prepared By	Miss. Shweta A. Rana						
Checked By	Mr. Jaivik Tandel						
DISCLAIMER							
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FOR
UniStar Environment and
Research Labs Pvt. Ltd.

Mr. Jaivik Tandel
(Authorized By)

UNISTAR ENVIROMENT & RESEARCH LABS PVT. LTD. GUJARAT VAPI

adani

CONTENTS

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 2021-March 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 2020 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

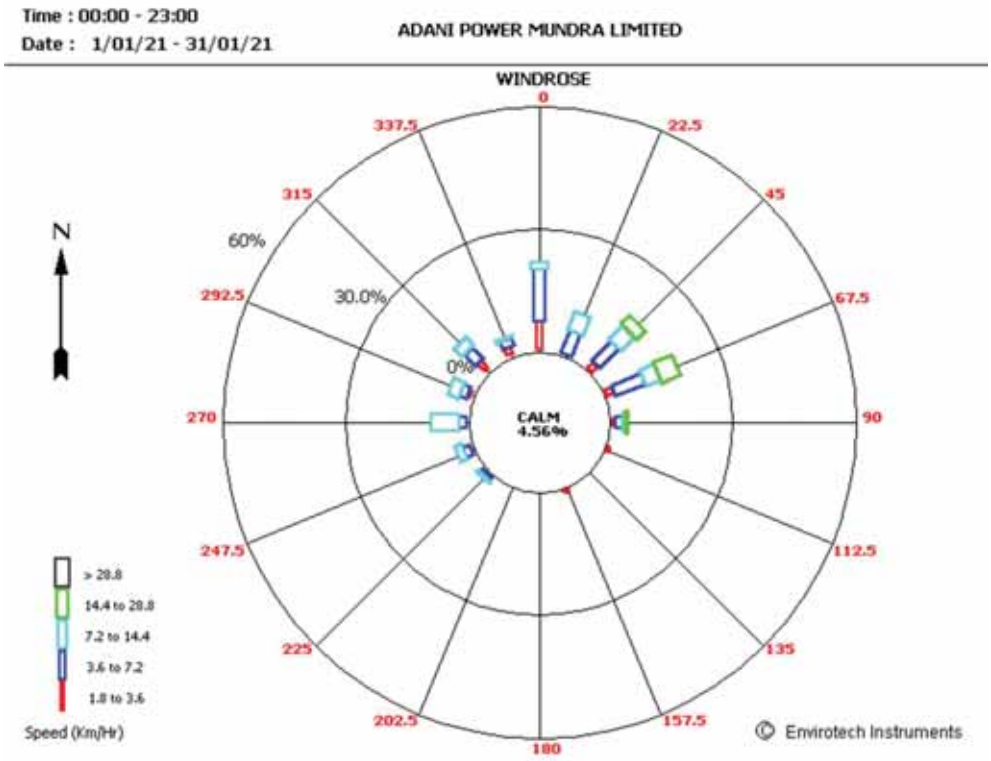
- Relative Humidity
- Ambient Temperature

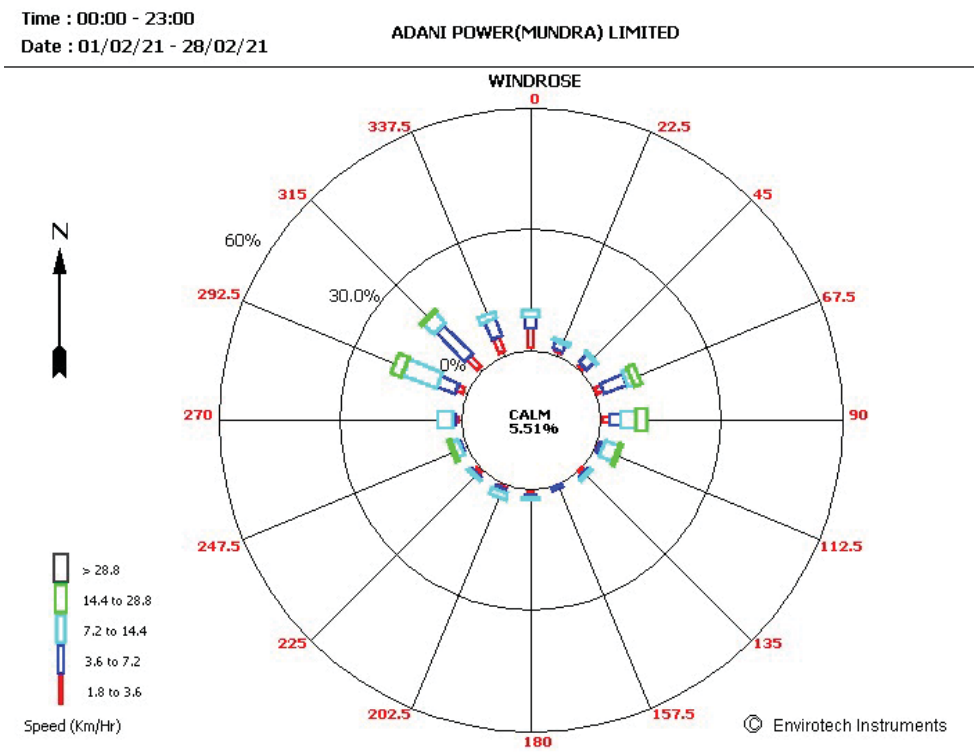
The above-said factors are considered as secondary factors since these factors control the dispersion of the pollutant indirectly by affecting the primary factors.

1.5.1 Wind Rose Diagram

Project	:	**Adani Power (Mundra) Limited (APMuL)**	**Period**	**:**	January 2021 to March 2021
Location	:	**Village – Tunda, Dist. - Kutch**			
January 2021					
Wind Direction			N		
Average Wind Speed			10.2 km/hr		
February 2021					
Wind Direction			WNW		
Average Wind Speed			5.1km/hr		
March 2021					
Wind Direction			NW		
Average Wind Speed			2.5 km/hr		

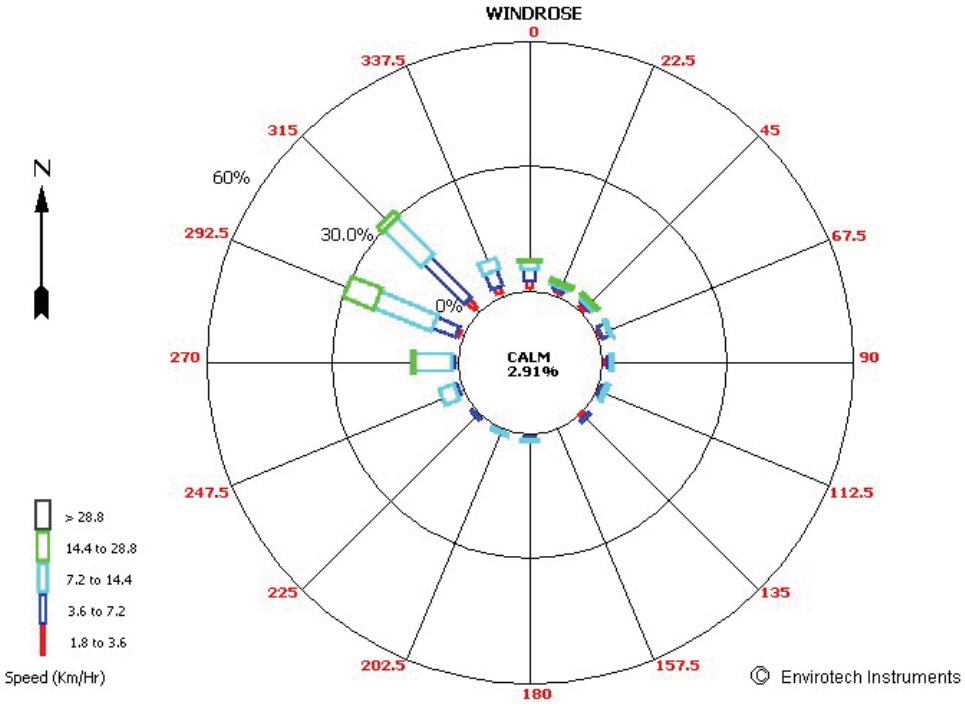
ADANI POWER (MUNDRA) LIMITED – MUNDRA WINDROSE FOR THE SEASON OF Jan. to March 2021





Time : 00:00 - 23:00
Date : 01/03/21 - 31/03/21

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)

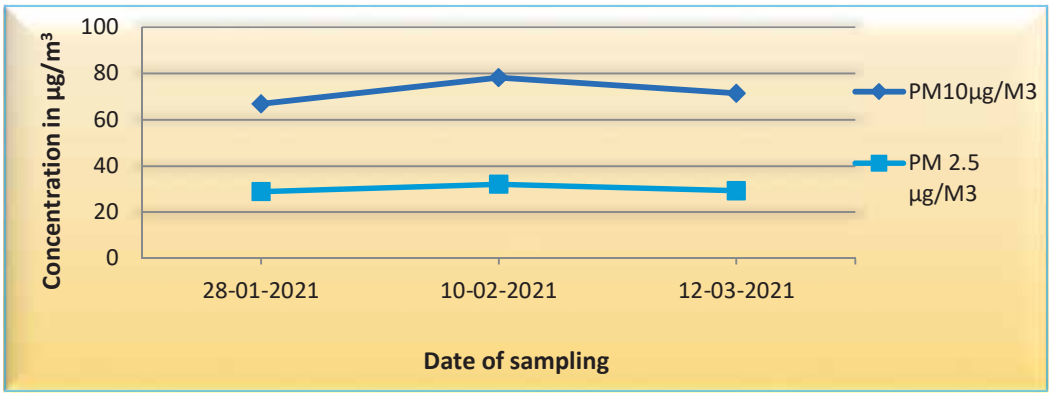
3.1.2 Location: Nr.20 MLD Plant

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.2021-March 2021) are as follows:

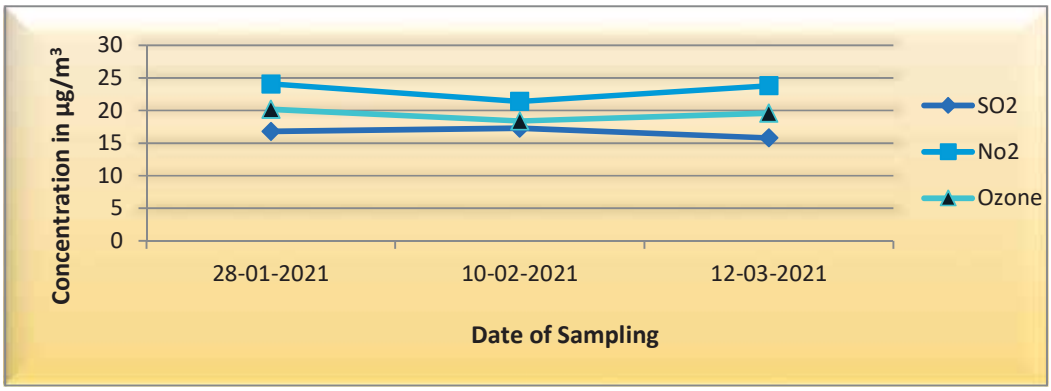
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	78.2	32.1	17.3	24.1	20.2
Minimum Value	66.9	28.9	15.8	21.4	18.4
Average Value	72.2	30.1	16.6	23.1	19.4
Standard Deviation	5.7	1.7	0.8	1.5	0.9
Permissible Limits	**100**	**60**	**80**	**80**	**100**

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



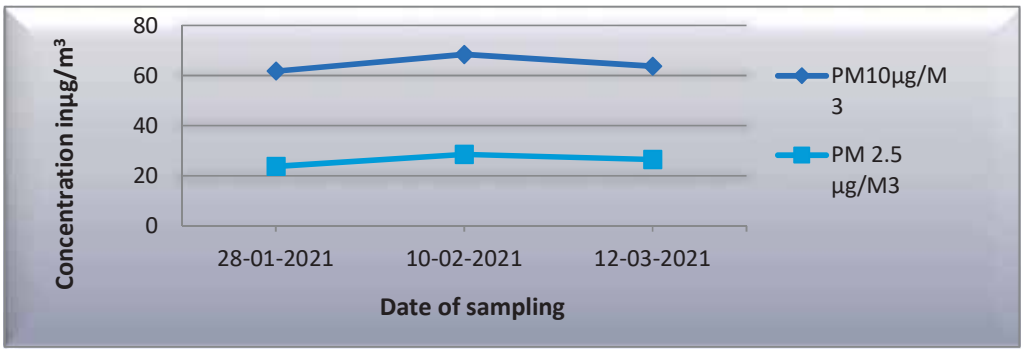
3.1.3 Location: Nr. Shantiniketan-1

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 (Jan.2021-March 2021) are as follows

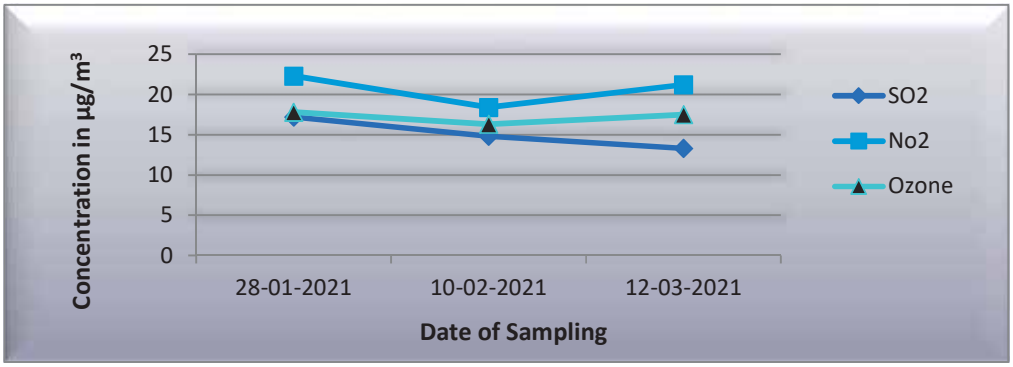
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	68.4	28.5	17.2	22.3	17.8
Minimum Value	61.7	23.7	13.3	18.4	16.3
Average Value	64.6	26.2	15.1	20.6	17.2
Standard Deviation	3.4	2.4	2.0	2.0	0.7
Permissible Limits	**100**	**60**	**80**	**80**	**100**

Units: $\mu g/m^3$

Graph 3: Particulate Matter Level Nr. Shantiniketan-1



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



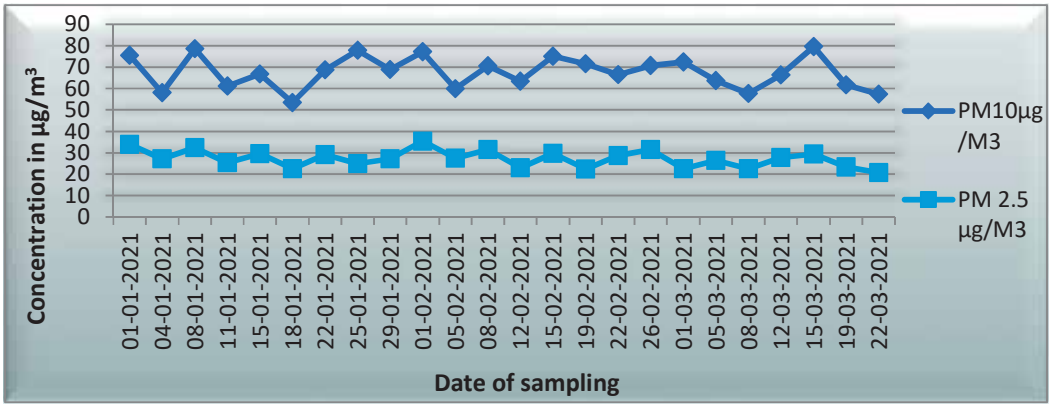
3.1.4 Location: Kandagara Village

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 1.5 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.2021-March 2021) are as follows.

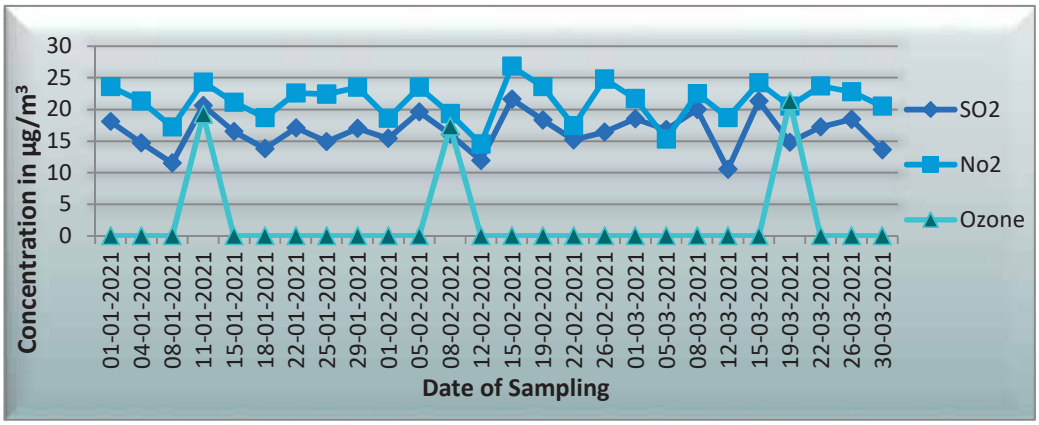
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	79.5	35.5	21.6	26.8	21.3
Minimum Value	53.4	20.7	10.5	14.5	17.3
Average Value	68.0	27.3	16.5	21.3	19.2
Standard Deviation	7.5	4.0	2.9	3.1	2.0
Permissible Limits	**100**	**60**	**80**	**80**	**100**

Units: µg/m^3

Graph 5: Particulate Matter Level Kandagara Village



Graph 6 : SO2, NO2 and O_3 Level Kandagara Village



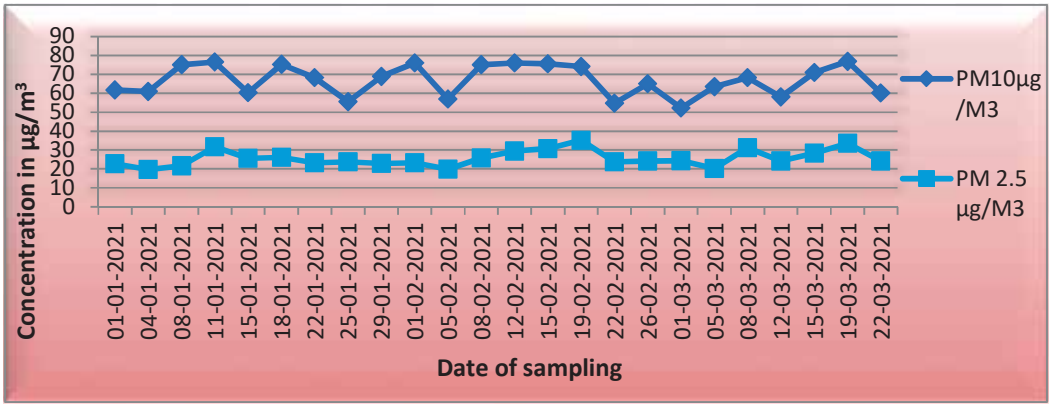
3.1.5 Location: Siracha Village

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.2021-March 2021) are as follows.

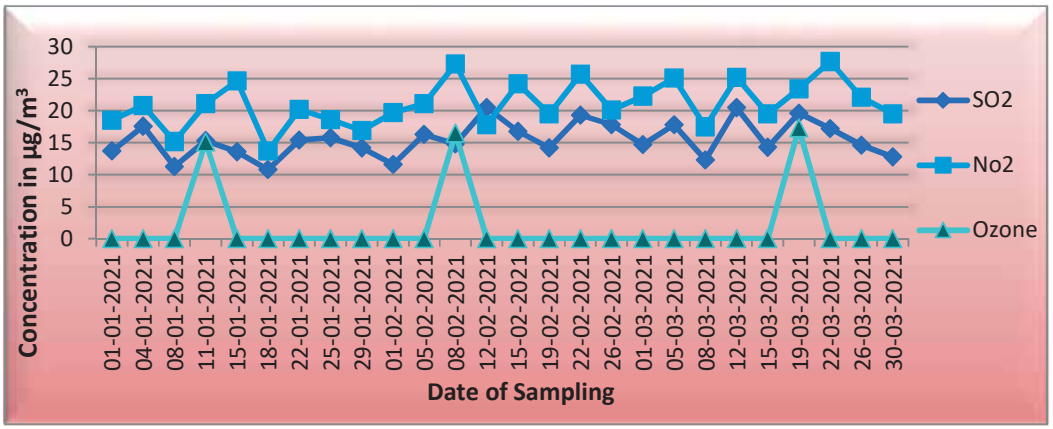
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	78.1	35.2	20.5	27.7	17.3
Minimum Value	52.2	19.7	10.8	13.7	15.1
Average Value	67.5	26.0	15.5	21.1	16.3
Standard Deviation	8.2	4.3	2.7	3.6	1.1
Permissible Limits	**100**	**60**	**80**	**80**	**100**

Units: µg/m^3

Graph 7 : Particulate Matter Level Siracha Village



Graph 8 : SO_2, NO_2 and O_3 Level Siracha Village



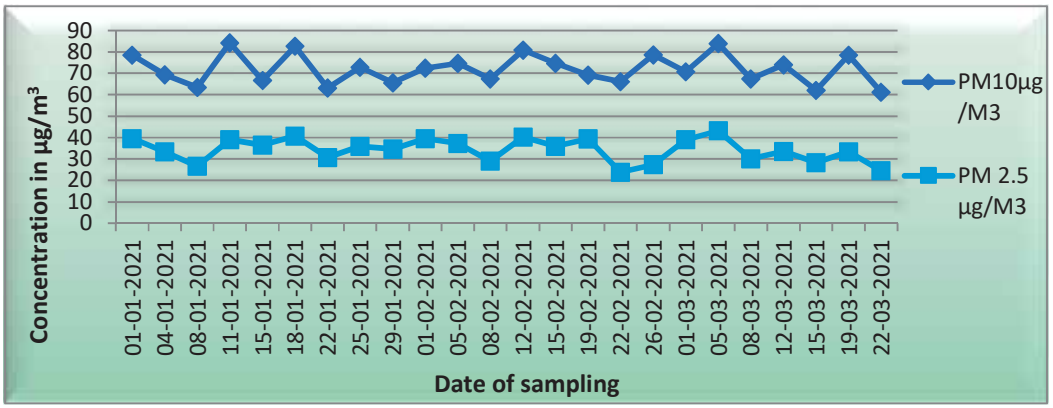
3.1.6 Location: Wandh Village

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.2021-March 2021) are as follows.

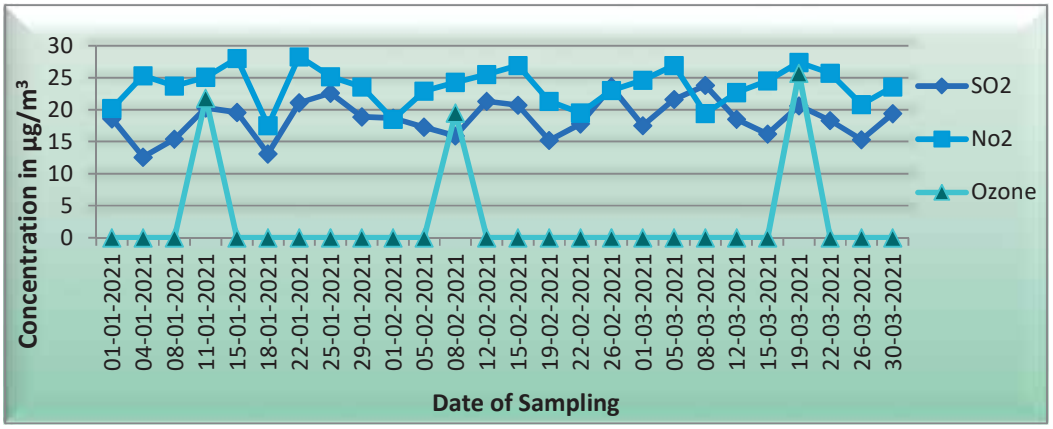
Observations	PM_{10}	$PM_{2.5}$	SO_2	NO_2	O_3
Maximum Value	84.2	43.2	23.8	28.3	25.7
Minimum Value	61.2	22.5	12.6	17.5	19.5
Average Value	72.0	33.8	18.6	23.6	22.4
Standard Deviation	7.1	5.8	3.0	3.0	3.1
Permissible Limits	**100**	**60**	**80**	**80**	**100**

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-2021			February-2021			March-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	**11.01.21**	19.2	BDL	**08.02.21**	17.3	BDL	**19.03.21**	21.3	BDL
Village Wandh	**11.01.21**	21.8	BDL	**08.02.21**	19.5	BDL	**19.03.21**	25.7	BDL
Village Siracha	**11.01.21**	15.1	BDL	**08.02.21**	16.5	BDL	**19.03.21**	17.3	BDL
Nr. 20 MLD Plant	**28.01.21**	20.2	BDL	**10.02.21**	18.4	BDL	**12.03.21**	19.6	BDL
Nr. Shantiniketan-1	**28.01.21**	17.8	BDL	**10.02.21**	16.3	BDL	**12.03.21**	17.5	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
11-01-2021	Boiler (Unit - 1)	32.8	569.7	242.8
26-03-2021	Boiler (Unit - 1)	36.2	534	268.9
11-01-2021	Boiler (Unit - 2)	34.9	574.3	235.7
01-02-2021	Boiler (Unit - 2)	33.2	569.4	281.3
19-03-2021	Boiler (Unit - 2)	31.7	561.6	256.7
18-01-2021	Boiler (Unit - 3)	34.1	473.7	231.9
13-02-2021	Boiler (Unit - 3)	31.1	541.9	272.6
03-03-2021	Boiler (Unit - 3)	33.8	535.4	279.4
18-01-2021	Boiler (Unit - 4)	40.3	518.3	250.7
13-02-2021	Boiler (Unit - 4)	35.6	532.6	254.1
03-03-2021	Boiler (Unit - 4)	36.8	520.6	255.8
29-01-2021	Boiler (Unit - 5)	36.1	468.2	254.4
20-02-2021	Boiler (Unit - 5)	36.2	478.4	261.9
08-03-2021	Boiler (Unit - 5)	38.4	482.4	277.1
29-01-2021	Boiler (Unit - 6)	39.1	472.9	239.7
20-02-2021	Boiler (Unit - 6)	38.4	464.8	256.4
08-03-2021	Boiler (Unit - 6)	37.3	478.6	263.4
30-03-2021	Boiler (Unit - 7)	33.6	171.2	256.1
30-01-2021	Boiler (Unit - 8)	31.7	148.1	236.9
12-02-2021	Boiler (Unit - 8)	31.3	152.6	235.7
30-01-2021	Boiler (Unit - 9)	30.3	130.7	240.5
12-02-2021	Boiler (Unit - 9)	30.5	131.7	242.1
20-03-2021	Boiler (Unit - 9)	42.1	184.2	297.7
Permissible Limits		**50**	**<500 MWH-600** **>500 MWH-200**	**300**

3.3 Water Quality Monitoring

3.3.1 Location: Tunda Village Water Sample **DATE: 04/02/2021**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.37	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	129.2	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	17.7	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1308	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	336.1	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	444.1	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	156.6	200 mg/lit.	400 mg/lit.
13	Nitrate as NO_3	mg/L	3.3	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	0.25	0.2 mg/lit.	1.0 mg/lit.
18	Fluoride as F	mg/L	0.62	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: Kandagara Village Water Sample **DATE: 04/02/2021**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.44	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	141.3	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	33.8	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	13.9	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1278	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	395.2	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	425.6	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	132.5	200 mg/lit.	400 mg/lit.
13	Nitrate as NO_3	mg/L	3.2	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	0.27	0.2 mg/lit.	1.0 mg/lit.
18	Fluoride as F	mg/L	0.58	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: 04/02/2021**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.31	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	197.2	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	38.5	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	24.6	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1238	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	270.4	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	386.3	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	144.5	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	0.26	0.2 mg/lit.	1.0 mg/lit.
18	Fluoride as F	mg/L	0.53	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

3.3.4 Location: Navinal Village Water Sample **DATE: 04/02/2021**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.51	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	164.2	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	35.4	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	18.5	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1174	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	256.2	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	412.3	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	146.1	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	0.27	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)	10	100 CFU/ml	100 CFU/ml

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

3.3.5Location: Desalpur Village Water Sample **DATE: 04/02/2021**

Sr. No.	Parameter	Unit	Results	Desirable Limits	Permissible limit in the absence of alternate source
1	pH @ 25	-	7.57	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	155.3	200 mg/lit.	600 mg/lit.
7	Calcium as Ca	mg/L	28.3	75 mg/lit.	200 mg/lit.
8	Magnesium as Mg	mg/L	20.6	30 mg/lit.	100 mg/lit.
9	Total Dissolved Solids	mg/L	1162	500 mg/lit.	2000 mg/lit.
10	Total Alkalinity	mg/L	345.1	200 mg/lit.	600 mg/lit.
11	Chloride as Cl^-	mg/L	410.5	250 mg/lit.	1000 mg/lit.
12	Sulphate as SO_4^{-2}	mg/L	122.3	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	0.26	0.2 mg/lit.	1.0 mg/lit.
18	Fluoride as F	mg/L	0.56	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: Outfall Channel

Sr. No.	Parameter	Unit	Date of sampling		
			01/01/2021	**04/02/2021**	**16/03/2021**
1	pH @ 25	--	7.83	7.77	8.01
2	Temperature	^{0}C (Intake)	21.5	22.5	25.5
		^{0}C (Outfall)	24.5	26.0	28.5
		^{0}C (Differential)	3.0	3.5	3.0
3	Color	Pt. CO. Scale	10	10	10
4	Total Suspended Solids	mg/L	28	24	28
5	Oil & Grease	mg/L	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)
6	Ammonical Nitrogen	mg/L	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)
7	Sulphide as S-2	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
8	Total Chromium	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
9	Hexavalent Chromium as Cr+6	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
10	Phosphate as PO_4	mg/L	0.21	0.24	0.27
11	Lead as Pb	mg/L	0.011	0.018	0.023
12	Copper as Cu	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
13	Zinc as Zn	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
14	Iron (as Fe)	mg/L	0.108	0.115	0.124
15	Chemical Oxygen Demand(COD)	mg/L	33.8	38.1	31.8
16	Biochemical Oxygen Demand (BOD)	mg/L	10.2	11	10.6

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

3.4.2 Location: STP Outlet Water Sample;

Sr. No.	Parameter	Unit	SPCB Limit	Date of sampling		
				01/01/2021	**04/02/2021**	**16/03/2021**
1	pH @ 25 ° C	--	**6.5-8.5**	7.49	7.41	7.58
2	Total Suspended Solids	mg/L	**30**	18	16	20
3	Residual Chlorine	mg/L	**0.5 Min.**	0.67	0.62	0.59
4	Biochemical Oxygen Demand (BOD)	mg/L	**20**	10	08	11
5	Fecal Coliform	CFU/100ml	**<1000**	46	42	46

3.4.3 Location: ETP Outlet Water Sample;

S.N	Parameter	Unit	SPCB Limit	Date of sampling		
				01/01/2021	04/02/2021	16/03/2021
1	pH @ 25	--	6.5 – 8.5	7.62	7.66	7.57
2	Temperature	° C	40 Max.	28	29	30
3	Color	Pt. CO. Scale	100 Max.	20	20	20
4	Total Suspended Solids	mg/L	100 Max.	17	16	14
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.	55.3	50.6	43.5
7	Biochemical Oxygen Demand (BOD)	mg/L	30 Max.	17	15	13
8	Chloride as Cl^-	mg/L	600 Max.	482.1	459.3	412.3
9	Total Dissolved Solids	mg/L	2100 Max.	1708	1628	1744
10	Sulphate as SO_4	mg/L	1000 Max.	117.6	96.2	102.5
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.	53.1	52.4	53.1
13	Sodium Absorption Ratio(SAR)	mg/L	26 Max.	2.5	2.3	2.7
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.	0.30	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: 10/03/2021**

Sr.No.	Parameter	Unit	Results			
			Borewell-1	**Borewell-2**	**Borewell-3**	**Borewell-4**
1	pH @ 25 ° C	-	7.56	7.33	7.72	7.41
2	Conductivity (µS)	-	15275	16870	15024	15973
3	Chloride as Cl^-	mg/L	4776	4329.4	4688.2	4692.3
4	Salinity (ppt)	mg/L	8.67	8.04	8.47	8.42
5	Total Dissolved Solids	mg/L	10416	11530	10064	10714
6	Carbonate as CaCO3	mg/L	24.1	33.9	30	29.7
7	Bicarbonate as CaCO3	mg/L	196.4	178.3	185.7	175.6
8	Mercury as Hg	mg/L	BDL(MDL:0.001)	BDL(MDL:0.001)	BDL(MDL:0.001)	BDL(MDL:0.001)
9	Arsenic as As	mg/L	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)
10	Lead as Pb	mg/L	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)
11	Chromium as Cr	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
12	Cadmium as Cd	mg/L	BDL(MDL:0.03)	BDL(MDL:0.03)	BDL(MDL:0.03)	BDL(MDL:0.03)
13	Iron (as Fe)	mg/L	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)
14	Zinc (as Zn)	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
15	Total Alkalinity	mg/L	451.0	414.8	408.1	468.7
16	Calcium as Ca	mg/L	359.7	347.8	303.4	375.8
17	Magnesium as Mg	mg/L	244.1	211.2	159.6	204
18	Sodium as Na	mg/L	1749.3	2050.2	1346	1652.3
19	Potassium as K	mg/L	104.6	121.7	97.4	97.2
20	Sulphate as SO4-2	mg/L	656.9	811.9	660.5	758.9
21	Nitrate as NO3	mg/L	27.1	29.8	23.8	29.4
22	Phosphate as PO_4	mg/L	2.87	3.2	2.14	3.01
23	Barium as Ba	mg/L	N.D.	N.D.	N.D.	N.D.
24	Fluoride as F	mg/L	2.52	2.91	2.09	2.91
25	Cobalt as Co	mg/L	N.D.	N.D.	N.D.	N.D.
26	Copper as Cu	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
27	Manganese as Mn	mg/L	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)
28	Nickel as Ni	mg/L	BDL(MDL:0.02)	BDL(MDL:0.02)	BDL(MDL:0.02)	BDL(MDL:0.02)

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**	**Unit-4**
Date of Sampling →				**09/01/2021**	**09/01/2021**	**09/01/2021**	**09/01/2021**
1	pH @ 25 ° C	--	-	7.81	7.86	8.25	7.71
2	Free available Chlorine	° C	Min. 0.5	0.69	0.63	0.70	0.72
3	Zinc as Zn	Pt. CO. Scale	1.0	BDL(MDL:0.05)	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)	BDL(MDL:0.05)
5	Total Chromium as Cr	mg/L	0.2	0.056	0.067	0.062	0.069
6	Phosphate as P	mg/L	5.0	0.35	0.36	0.51	0.45

S.No.	Parameter	Unit	Limit	Results				
				Unit-5	**Unit-6**	**Unit-7**	**Unit-8**	**Unit-9**
Date of Sampling →				**09/01/2021**	**09/01/2021**	**09/01/2021**	**09/01/2021**	**09/01/2021**
1	pH @ 25 ° C	--	-	7.66	7.81	7.85	7.81	8.03
2	Free available Chlorine	° C	Min. 0.5	0.69	0.62	0.69	0.70	0.66
3	Zinc as Zn	Pt. CO. Scale	1.0	BDL(MDL:0.05)	BDL(MDL:0.05)	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)	BDL(MDL:0.05)	BDL(MDL:0.05)
5	Total Chromium as Cr	mg/L	0.2	0.063	0.058	0.059	0.058	0.059
6	Phosphate as P	mg/L	5.0	0.43	0.47	0.38	0.33	0.45

3.4.6 Location: Condensate Cooling Tower Water Sample							
S.No.	Parameter	Unit	Limit	Results			
				Unit-1	Unit-2	Unit-3	Unit-4
Date of Sampling →				09/01/2021	09/01/2021	09/01/2021	09/01/2021
1	pH @ 25 ° C	--	6.5 to 8.5	7.73	7.80	7.83	7.84
2	Temperature ^{0}C (Intake)	^{0}C	--	27.2	27.2	27.3	27.7
	Temperature ^{0}C (Outlet)	^{0}C	--	29.3	29.4	29.3	30.0
	Temperature ^{0}C (Differential)	^{0}C	7	2.1	2.2	2.0	2.3
3	Free available Chlorine	mg/L	Min 0.5	0.75	0.79	0.76	0.71

S.No.	Parameter	Unit	Limit	Results				
				Unit-5	Unit-6	Unit-7	Unit-8	Unit-9
Date of Sampling →				09/01/2021	09/01/2021	09/01/2021	09/01/2021	09/01/2021
1	pH @ 25 ° C	--	6.5 to 8.5	7.83	7.84	8.05	7.83	8.04
2	Temperature ^{0}C (Intake)	^{0}C	--	27.1	27.1	27.3	27.6	27.7
	Temperature ^{0}C (Outlet)	^{0}C	--	29.2	29.2	29.7	30.1	30.1
	Temperature ^{0}C (Differential)	^{0}C	7	2.1	2.1	2.4	2.5	2.4
3	Free available Chlorine	mg/L	Min 0.5	0.73	0.74	0.81	0.80	0.83

3.4.7 Location: Boiler Blow Down Water Sample			DATE: 04/02/2021	
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: 04/02/2021

Locations of soil sampling ⇨			**Kandagara**	**Tunda**	**Desalpur**	**Siracha**	**Navinal**
Sr. No.	**Parameter**	**Unit**	**Results**				
1	Magnesium as Mg	%	0.0051	0.0040	0.0059	0.0051	0.0097
2	Molybdenum as Mo	%	N.D.	N.D.	N.D.	N.D.	N.D.
3	Phosphorous as P	%	0.304	0.3391	0.2203	0.2823	0.2324
4	Calcium as Ca	%	0.037	0.026	0.017	0.0352	0.0267
5	Zinc as Zn	%	0.005	0.0018	0.0025	0.0026	0.0024
6	Manganese as Mn	%	0.018	0.025	0.0281	0.029	0.0241
7	Potassium as K	%	0.0049	0.0040	0.0034	0.0024	0.0035
8	Nitrogen as N	%	0.0064	0.0079	0.0083	0.0067	0.0089
9	Iron as Fe	%	0.3214	0.484	0.4411	0.7623	1.1253
10	Copper as Cu	%	0.0008	0.0006	0.0006	0.0004	0.0004
11	Boron as B	%	N.D.	N.D.	N.D.	N.D.	N.D.
12	Sulphur	%	0.0052	0.0081	0.0050	0.0081	0.0081
13	Chlorides as Cl	%	0.0051	0.0158	0.0148	0.0581	0.040
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: 09-10.0
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	11:50 am - 13:45 pm	61.6	22:50 pm - 00:30 am	58.9
2.	Nr. 20 MLD Plant		62.8		59.4
3.	Nr. Pump House		63.4		61.0
4.	Nr. Coal Handling plant		64.9		58.6
5.	Nr. Gate No.4		57.5		56.0
6.	Nr. Integrated Ash Silo		66.4		62.0
7.	Nr. Main Gate		62.0		59.0
8.	Nr. APCH Building		60.7		58.0
9.	Nr. Shantiniketan-I		58.3		57.0
10.	Nr. OHC Building		59.7		56.3

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

Date of Monitoring: 12-13.02.2021
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	11:40 am - 13:10 pm	62.7	22:45 pm -00:10 am	61.5
2.	Nr. 20 MLD Plant		61.5		59.9
3.	Nr. Pump House		61.1		58.4
4.	Nr. Coal Handling plant		64.1		61.1
5.	Nr. Gate No.4		58.4		55.7
6.	Nr. Integrated Ash Silo		64.6		61.6
7.	Nr. Main Gate		62.2		59.0
8.	Nr. APCH Building		61.0		58.7
9.	Nr. Shantiniketan-I		61.2		59.2
10.	Nr. OHC Building		61.1		58.8

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

Date of Monitoring: 11-12.03.2021

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	11:55 am - 13:40 pm	66.7	22:50 pm -00:30 am	**63.4**
2.	Nr. 20 MLD Plant		63.7		**61.1**
3.	Nr. Pump House		64.1		**62.5**
4.	Nr. Coal Handling plant		67.6		**63.8**
5.	Nr. Gate No.4		60.2		**56.3**
6.	Nr. Integrated Ash Silo		68.3		**64.2**
7.	Nr. Main Gate		61.3		**58.2**
8.	Nr. APCH Building		60.5		**58.4**
9.	Nr. Shantiniketan-I		59.7		**57.3**
10.	Nr. OHC Building		62.1		**59.6**

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' 2020 TO Mar'2021)

	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-20	29.2	516.4	240.0	39.6	479.8	253.9	34.5	494.3	240.7
2-Oct-20	29.1	514.7	239.6	37.4	484.9	249.9	33.6	493.1	240.4
3-Oct-20	29.5	515.8	239.3	40.5	486.2	247.7	34.6	493.9	240.6
4-Oct-20	29.4	508.1	237.8	40.3	489.9	246.1	35.1	494.7	240.6
5-Oct-20	29.2	507.0	237.7	36.3	482.9	251.0	34.6	496.5	240.5
6-Oct-20	29.1	507.7	237.6	31.1	498.6	246.5	34.1	495.4	240.7
7-Oct-20	29.1	508.8	237.6	32.4	528.5	233.2	34.3	495.1	240.5
8-Oct-20	29.2	508.3	236.9	31.7	535.1	229.5	34.0	497.2	240.3
9-Oct-20	29.1	500.6	236.5	31.2	520.2	238.2	34.1	498.6	240.6
10-Oct-20	29.1	505.7	236.0	30.8	487.8	253.8	34.4	499.2	240.8
11-Oct-20	29.2	496.9	235.4	31.0	424.5	296.6	34.4	499.3	240.9
12-Oct-20	29.0	498.0	235.2	30.3	521.6	230.1	34.4	500.8	240.8
13-Oct-20	29.0	494.5	235.1	30.7	544.2	217.7	34.6	498.9	240.7
14-Oct-20	29.0	493.8	235.1	29.1	520.6	233.3	34.5	499.6	240.4
15-Oct-20	28.7	499.9	234.4	29.6	502.8	237.4	34.3	507.6	225.4
16-Oct-20	30.3	484.7	233.7	29.5	501.7	237.6	32.5	521.6	225.6
17-Oct-20	29.2	490.4	233.8	31.6	545.3	204.0	32.1	525.9	237.1
18-Oct-20	28.9	494.7	234.7	32.7	543.2	202.7	32.0	527.1	237.6
19-Oct-20	30.9	487.2	234.5	32.0	532.5	212.0	32.1	529.5	238.1
20-Oct-20	28.8	489.4	235.5	30.1	517.4	227.1	33.1	528.4	237.6
21-Oct-20	30.2	486.6	234.1	30.6	512.3	230.9	32.5	519.7	236.7
22-Oct-20	30.0	491.6	234.4	29.6	468.5	261.8	31.2	522.9	236.6
23-Oct-20	29.5	479.4	233.0	30.0	484.0	253.1	31.1	529.7	237.8
24-Oct-20	29.6	487.1	231.5	30.0	525.8	223.9	30.3	526.2	237.7
25-Oct-20	29.0	602.2	241.1	30.6	567.4	188.1	29.2	525.7	237.6
26-Oct-20	29.0	576.1	237.9	31.4	534.3	216.1	29.2	526.2	237.6
27-Oct-20	30.2	510.7	228.2	31.0	516.2	230.9	29.5	527.3	237.7
28-Oct-20	28.9	451.3	217.7	29.8	523.7	222.2	28.4	526.9	238.0
29-Oct-20	30.3	466.0	220.1	29.9	544.1	202.4	28.9	526.5	238.5
30-Oct-20	30.4	464.0	215.7	29.6	522.2	217.5	28.0	525.8	238.3
31-Oct-20	33.0	458.3	215.3	30.2	503.4	235.8	28.0	526.5	238.1
1-Nov-20	32.1	456.5	214.4	30.4	504.9	237.1	28.7	527.3	237.4
2-Nov-20	31.2	455.0	215.5	28.9	520.6	227.7	29.6	526.6	237.7
3-Nov-20	31.7	452.4	214.7	29.6	537.3	206.5	29.0	527.0	237.7
4-Nov-20	29.2	468.5	217.6	31.0	503.9	213.9	29.3	526.8	238.1
5-Nov-20	29.9	500.3	220.7	31.1	511.2	199.7	29.1	520.1	237.4
6-Nov-20	28.6	465.5	215.6	32.7	493.1	213.1	29.3	517.3	236.9
7-Nov-20	27.0	467.0	216.7	29.4	443.8	234.9	27.4	521.9	238.1
8-Nov-20	27.0	459.5	215.9	29.5	485.8	247.3	27.0	523.8	238.0
9-Nov-20	26.2	461.0	216.3	29.7	502.8	246.0	28.2	525.9	237.8
10-Nov-20	28.0	460.8	216.3	30.8	493.0	253.1	27.2	528.5	238.1
11-Nov-20	27.4	456.5	217.1	30.1	494.8	244.2	27.0	529.4	238.1
12-Nov-20	28.2	455.0	217.8	29.0	503.9	223.3	28.2	528.9	238.0
13-Nov-20	29.6	465.2	213.3	29.4	515.7	220.3	28.4	527.9	238.5
14-Nov-20	27.7	464.3	213.8	28.2	533.1	210.2	27.7	527.0	237.9
15-Nov-20	27.1	467.4	214.5	27.6	522.6	201.6	27.2	526.0	238.3
16-Nov-20	25.4	473.2	215.8	26.0	517.1	201.3	24.9	525.6	238.7
17-Nov-20	27.3	467.4	214.8	28.8	490.1	225.5	25.6	526.6	238.7
18-Nov-20	25.5	474.3	215.6	26.2	480.8	231.7	25.2	528.0	238.8
19-Nov-20	26.6	460.6	213.1	27.8	468.4	243.4	26.2	530.6	238.5
20-Nov-20	27.8	454.2	212.3	28.6	463.8	250.8	26.4	526.2	236.6
21-Nov-20	26.8	451.0	212.9	27.1	455.6	257.2	26.2	529.9	238.4
22-Nov-20	29.3	458.3	213.0	29.2	467.1	238.1	28.1	529.3	238.3
23-Nov-20	30.4	471.0	215.5	29.8	497.6	217.9	29.7	527.8	238.6
24-Nov-20	30.3	483.6	217.4	29.5	543.2	183.1	30.4	526.4	238.3
25-Nov-20	28.3	483.3	217.4	28.3	532.2	193.9	27.1	525.6	238.6
26-Nov-20	25.1	487.2	218.1	26.2	522.3	215.5	24.2	525.8	238.8
27-Nov-20	26.2	484.0	217.8	27.2	519.4	233.5	24.7	527.5	238.6
28-Nov-20	26.8	476.5	216.5	27.7	508.4	246.1	26.5	527.8	238.8
29-Nov-20	28.6	472.5	215.9	29.5	512.1	244.6	27.0	531.2	239.5
30-Nov-20	31.4	469.3	215.2	31.2	530.4	230.6	28.8	528.5	238.7

Note : Blank coloum -Unit is in shutdown

Adani Power (Mundra) Limited, Mundra

Continues Environment Monitoring System Reports (Oct' 2020 TO Mar'2021)

	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-20	30.9	469.1	215.4	29.9	555.6	210.3	28.2	529.8	239.1
2-Dec-20	31.5	464.8	214.4	30.2	537.1	226.6	29.5	528.1	245.6
3-Dec-20	31.4	467.9	214.7	30.0	539.9	224.3	30.0	524.9	256.0
4-Dec-20	32.3	475.3	215.6	30.3	546.5	214.4	29.8	526.3	257.0
5-Dec-20	32.8	476.8	215.8	29.2	552.2	208.5	30.5	524.1	257.8
6-Dec-20	31.2	478.9	215.6	29.9	558.6	203.2	29.1	524.1	257.7
7-Dec-20	29.7	477.0	216.2	29.0	558.3	204.2	28.4	528.3	251.6
8-Dec-20	30.7	473.6	215.7	29.6	552.7	209.8	29.6	534.7	231.1
9-Dec-20	29.9	474.3	215.9	28.8	551.7	209.9	29.2	526.0	222.6
10-Dec-20	28.9	481.6	216.6	29.4	541.4	216.4	28.1	521.8	226.9
11-Dec-20	27.4	496.2	218.2	27.7	545.2	210.8	26.2	536.1	229.4
12-Dec-20	28.9	498.5	218.3	28.2	531.9	220.4	27.5	533.1	245.1
13-Dec-20	25.3	486.6	217.2	25.9	511.9	241.1	25.4	514.5	236.5
14-Dec-20	27.2	467.8	213.8	27.3	488.2	266.7	26.3	528.6	241.0
15-Dec-20	28.6	451.7	211.7	27.8	481.9	277.9	27.4	534.3	239.4
16-Dec-20	26.9	465.7	214.3	27.1	491.1	266.7	25.8	517.2	225.5
17-Dec-20	27.4	490.5	225.0	27.5	493.2	262.3	25.9	514.8	237.9
18-Dec-20	29.7	514.3	234.4	28.6	492.5	263.6	27.3	461.2	228.2
19-Dec-20	29.1	539.4	219.0	27.9	492.2	265.8	27.3	424.1	217.4
20-Dec-20	29.2	537.1	229.1	28.2	492.5	266.2	28.0	404.9	206.4
21-Dec-20	29.4	531.9	237.2	28.2	494.5	264.9	27.5	399.2	197.3
22-Dec-20	29.0	542.6	231.6	29.1	500.9	258.5	27.9	452.1	220.4
23-Dec-20	28.3	549.0	222.4	28.7	500.2	257.5	27.7	450.6	225.9
24-Dec-20	28.6	535.6	219.2	29.1	490.5	267.2	27.2	417.1	212.9
25-Dec-20	27.9	538.4	228.3	28.1	496.5	261.9	27.0	401.3	200.8
26-Dec-20	29.9	504.3	232.5	29.8	508.1	245.5	28.1	400.2	197.9
27-Dec-20	21.5	478.8	216.4	27.2	492.5	261.2	26.4	400.8	196.9
28-Dec-20	26.2	460.6	219.6	28.8	474.6	291.0	27.1	427.7	205.3
29-Dec-20	26.5	488.9	234.7	27.3	475.8	298.2	25.6	468.3	230.0
30-Dec-20	27.4	498.7	230.7	27.8	475.4	294.9	26.8	458.8	226.7
31-Dec-20	27.8	510.1	224.1	28.1	475.7	290.7	27.2	454.5	229.0
1-Jan-21	27.7	504.1	234.4	27.8	498.3	269.2	27.0	470.9	224.2
2-Jan-21	28.5	500.2	249.0	28.9	524.8	244.1	27.6	489.6	235.6
3-Jan-21	27.8	505.3	249.8	28.5	530.0	230.4	26.3	459.7	225.7
4-Jan-21	28.2	505.6	248.6	28.7	536.6	219.9	26.9	429.0	216.7
5-Jan-21	28.8	505.3	213.4	28.9	552.1	198.4	27.3	440.3	220.4
6-Jan-21	25.5	489.9	219.0	26.5	548.9	201.7	24.8	444.5	225.0
7-Jan-21	26.5	475.2	218.4	28.7	548.0	211.4	26.2	419.5	215.3
8-Jan-21	26.3	468.5	218.1	28.8	544.1	214.7	26.0	399.7	201.4
9-Jan-21	26.4	483.5	218.4	28.1	536.2	227.4	25.4	447.0	219.1
10-Jan-21	27.9	525.1	221.7	28.4	545.2	215.4	26.4	444.4	225.7
11-Jan-21	29.3	513.9	220.7	29.4	544.8	215.1	26.4	468.1	228.7
12-Jan-21	28.6	494.3	220.3	29.6	539.2	227.4	25.9	457.0	228.9
13-Jan-21	29.8	509.4	224.2	29.6	547.4	221.1	27.7	452.5	225.1
14-Jan-21	28.4	524.3	231.2	28.8	550.7	209.9	27.1	469.4	231.6
15-Jan-21	30.1	252.1	230.2	29.4	554.6	200.3	27.8	472.8	231.1
16-Jan-21	30.4	316.2	229.5	30.1	555.8	201.3	28.8	456.7	230.0
17-Jan-21	29.1	536.0	230.6	30.6	556.3	198.3	28.4	420.9	216.0
18-Jan-21	28.9	533.9	231.3	29.7	550.7	202.2	27.7	401.7	202.5
19-Jan-21	30.5	543.7	231.7	31.7	555.5	196.1	28.1	414.4	204.4
20-Jan-21	28.3	549.7	232.5	28.8	562.5	190.9	26.7	428.6	220.8
21-Jan-21	32.8	545.0	232.2	29.3	560.6	195.5	29.0	399.0	210.2
22-Jan-21	31.5	554.6	231.1	29.7	566.1	189.4	28.9	393.3	200.4
23-Jan-21	17.6	285.8	123.3	29.7	513.0	245.4	29.0	445.4	227.3
24-Jan-21				27.4	477.7	286.6	26.7	438.9	241.4
25-Jan-21				27.8	511.3	257.8	26.8	426.1	230.2
26-Jan-21				28.0	506.7	268.4	27.3	413.4	219.2
27-Jan-21				28.5	507.4	263.6	27.3	429.2	222.3
28-Jan-21				27.3	504.9	265.2	26.4	473.1	245.9
29-Jan-21				28.0	506.9	264.9	27.1	438.7	234.1
30-Jan-21				28.7	511.6	261.8	28.1	415.8	220.0
31-Jan-21				29.5	518.0	253.4	28.1	406.5	213.2

Note : Blank coloum -Unit is in shutdown

Adani Power (Mundra) Limited, Mundra

Continues Environment Monitoring System Reports (April'2020 TO September'2020)

	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-21				30.2	525.2	238.9	27.7	405.3	213.3
2-Feb-21				30.1	542.7	216.3	29.0	405.0	213.2
3-Feb-21							28.2	402.3	213.1
4-Feb-21							26.6	441.9	230.9
5-Feb-21							27.2	450.4	240.9
6-Feb-21							28.6	426.8	231.0
7-Feb-21							27.0	410.8	222.0
8-Feb-21							26.7	454.7	237.9
9-Feb-21							27.6	490.9	251.8
10-Feb-21							28.9	461.2	248.0
11-Feb-21							28.3	432.4	236.9
12-Feb-21							27.5	471.5	243.9
13-Feb-21							26.9	497.7	254.3
14-Feb-21							26.9	443.7	241.9
15-Feb-21							27.8	477.2	245.5
16-Feb-21							28.0	490.5	251.2
17-Feb-21							27.5	468.5	247.7
18-Feb-21							27.3	450.4	246.6
19-Feb-21							27.5	471.0	248.1
20-Feb-21							28.8	485.5	257.1
21-Feb-21							29.5	454.3	252.2
22-Feb-21							31.9	468.9	257.0
23-Feb-21							31.7	484.5	253.7
24-Feb-21							30.4	474.8	230.6
25-Feb-21							33.0	470.9	257.4
26-Feb-21							28.7	458.5	248.8
27-Feb-21							31.1	465.9	253.2
28-Feb-21							29.8	459.8	250.5
1-Mar-21							28.9	487.1	254.7
2-Mar-21							29.5	508.2	264.3
3-Mar-21							30.6	482.7	261.3
4-Mar-21							32.6	484.7	257.4
5-Mar-21							33.4	475.9	254.0
6-Mar-21							31.9	476.5	256.2
7-Mar-21							29.4	434.1	251.6
8-Mar-21							32.1	446.7	253.6
9-Mar-21							33.0	431.9	253.7
10-Mar-21							32.9	412.6	253.0
11-Mar-21				28.3	495.0	263.8	28.9	423.2	253.6
12-Mar-21				27.8	491.4	201.9	19.8	178.2	106.4
13-Mar-21				28.2	504.4	241.2			
14-Mar-21				26.4	475.7	277.3			
15-Mar-21				28.3	495.0	263.8			
16-Mar-21				28.2	521.2	238.1			
17-Mar-21				28.5	517.7	237.3			
18-Mar-21				29.7	530.0	234.5			
19-Mar-21				28.4	520.3	239.2			
20-Mar-21	30.7	447.9	225.8	26.0	522.2	239.4			
21-Mar-21	34.1	568.3	254.8	29.1	540.3	224.4			
22-Mar-21	34.6	520.5	241.3	28.7	536.1	225.2			
23-Mar-21	33.5	440.4	224.3	27.7	538.3	222.1			
24-Mar-21	31.2	467.2	226.6	25.6	495.2	257.9			
25-Mar-21	30.7	447.9	225.8	25.8	463.9	296.0			
26-Mar-21	32.6	488.9	245.6	28.3	487.1	277.5			
27-Mar-21	32.6	533.9	244.7	27.1	527.4	234.5			
28-Mar-21	32.0	496.5	229.6	26.8	569.0	197.4			
29-Mar-21	31.6	511.9	231.9	27.4	587.4	175.7			
30-Mar-21	29.6	560.5	237.6	26.7	568.7	201.7	27.4	461.6	211.2
31-Mar-21	30.4	560.6	248.8	27.5	516.0	243.0	36.1	458.4	217.7

Note : Blank coloum -Unit is in shutdown

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Adani Power (Mundra) Limited, Mundra

Continues Environment Monitoring System Reports (Oct' 2020 TO Mar'2021)

	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-20	34.6	544.4	238.3	33.2	461.6	243.7	33.5	445.4	238.6
2-Oct-20	34.6	543.0	238.5	31.8	437.4	227.6	32.4	433.4	221.6
3-Oct-20	34.7	546.9	237.9	32.2	442.7	231.9	32.5	437.5	227.4
4-Oct-20	34.6	549.5	237.7	32.5	453.2	236.1	32.6	438.1	228.9
5-Oct-20	34.7	544.4	237.9	33.6	469.2	247.8	34.5	456.5	253.6
6-Oct-20	34.6	541.5	237.9	34.5	480.9	257.3	35.1	460.4	259.0
7-Oct-20	34.4	520.5	237.3	35.5	493.4	267.6	35.0	459.7	257.1
8-Oct-20	34.2	531.9	235.2	34.9	488.0	262.3	35.2	461.0	259.7
9-Oct-20	34.2	537.5	234.2	35.5	494.2	268.1	35.2	461.3	259.9
10-Oct-20	34.3	539.1	233.6	34.9	487.7	261.9	34.9	459.9	258.3
11-Oct-20	34.3	538.2	233.8	34.8	487.2	261.0	34.8	459.1	256.6
12-Oct-20	34.2	540.3	233.9	34.6	484.3	258.7	34.4	457.3	254.4
13-Oct-20	34.3	536.6	234.4	34.6	484.6	258.9	34.5	457.1	253.6
14-Oct-20	34.0	531.3	234.4	33.9	476.2	252.2	33.9	451.8	247.2
15-Oct-20	33.7	533.4	226.2	33.5	466.6	246.5	33.9	451.4	247.0
16-Oct-20	34.0	548.5	216.8	35.5	493.9	267.8	34.7	457.9	254.2
17-Oct-20	34.5	559.0	216.0	35.8	497.7	270.7	34.4	456.9	254.0
18-Oct-20	34.1	557.7	215.4	35.0	487.7	261.1	34.8	458.8	257.3
19-Oct-20	34.0	521.1	214.7	36.9	509.3	280.8	35.5	464.3	265.6
20-Oct-20	31.7	526.4	213.8	36.4	504.4	277.0	35.2	461.8	261.0
21-Oct-20	33.7	536.1	212.0	35.4	493.4	267.0	34.9	459.2	257.1
22-Oct-20	33.1	525.3	212.7	36.1	499.8	273.2	34.9	458.7	256.0
23-Oct-20	35.1	536.7	212.2	34.2	506.5	268.3	34.2	452.6	248.3
24-Oct-20	33.6	536.6	212.4	32.7	451.6	237.8	33.0	441.2	233.2
25-Oct-20	33.5	538.4	212.2	32.4	443.8	233.9	32.7	438.2	228.3
26-Oct-20	34.2	532.8	212.8	32.6	449.9	236.3	33.3	444.2	237.2
27-Oct-20	31.9	530.5	212.9	34.5	478.6	256.8	34.3	452.9	248.6
28-Oct-20	30.8	532.7	212.6	35.2	490.4	264.6	34.5	455.0	251.6
29-Oct-20	31.3	536.8	211.8	34.5	479.5	257.1	34.0	450.7	245.3
30-Oct-20	31.3	532.7	212.1	34.1	470.4	251.9	33.8	446.9	239.9
31-Oct-20	31.2	536.7	212.1	34.3	475.3	255.0	34.3	454.6	251.5
1-Nov-20	30.7	534.6	212.3	32.6	455.7	237.8	33.4	446.6	239.5
2-Nov-20	31.3	529.9	212.8	34.4	473.2	255.1	34.5	454.5	250.6
3-Nov-20	30.1	528.0	213.1	35.2	490.5	264.2	34.9	459.3	257.1
4-Nov-20	30.9	531.5	212.5	35.6	493.6	268.1	34.7	458.6	256.4
5-Nov-20	31.3	538.2	211.5	35.1	488.2	263.5	34.6	457.9	255.4
6-Nov-20	32.5	538.8	210.7	34.9	486.7	261.9	34.6	457.2	254.4
7-Nov-20	28.9	536.8	210.9	34.6	483.6	258.7	34.4	454.8	250.6
8-Nov-20	28.9	534.1	211.6	33.7	472.2	249.5	33.8	450.9	245.5
9-Nov-20	30.3	530.8	211.9	34.0	471.2	251.3	33.9	449.5	243.1
10-Nov-20	28.6	527.2	211.9	34.6	478.7	257.3	34.4	455.5	251.0
11-Nov-20	28.2	526.5	212.0	34.4	474.0	254.6	34.0	450.4	244.2
12-Nov-20	27.9	517.5	212.9	34.6	476.6	256.9	34.1	449.4	243.5
13-Nov-20	29.1	519.6	212.7	33.3	461.8	244.0	33.4	444.0	236.0
14-Nov-20	28.4	531.5	211.2	31.4	429.4	222.9	32.4	434.6	223.1
15-Nov-20	28.1	533.2	210.9	31.6	431.8	225.6	31.7	426.3	212.0
16-Nov-20	25.9	522.9	211.3	31.9	439.1	228.8	31.8	428.3	214.9
17-Nov-20	29.6	510.8	212.4	33.2	454.6	242.0	33.6	446.2	239.2
18-Nov-20	27.8	501.7	212.7	33.3	459.0	243.7	33.5	445.3	237.7
19-Nov-20	28.5	500.3	213.4	34.2	471.1	253.4	33.8	447.7	240.7
20-Nov-20	29.3	507.8	213.2	33.4	459.5	244.9	34.2	452.0	247.0
21-Nov-20	28.0	501.5	214.0	34.6	479.3	257.7	34.5	454.1	250.2
22-Nov-20	29.4	507.7	213.4	33.8	468.8	249.8	34.0	449.7	243.6
23-Nov-20	30.8	514.2	211.9	34.8	478.8	259.2	34.1	450.1	244.5
24-Nov-20	32.2	516.2	211.1	34.4	475.2	255.7	33.9	448.2	241.3
25-Nov-20	30.0	505.8	211.8	33.6	464.3	246.7	33.6	444.8	237.2
26-Nov-20	27.2	498.5	212.2	32.6	447.2	236.4	33.5	443.4	235.8
27-Nov-20	27.5	501.7	212.3	33.0	454.1	240.6	33.4	443.0	234.8
28-Nov-20	28.3	503.1	212.1	33.3	453.4	242.6	33.2	440.2	230.5
29-Nov-20	30.3	501.4	212.4	32.8	449.0	237.9	33.7	446.9	240.5
30-Nov-20	32.6	522.2	210.4	33.8	462.7	248.3	33.6	445.7	237.2

Note : Blank coloum -Unit is in shutdown

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Adani Power (Mundra) Limited, Mundra

Continues Environment Monitoring System Reports (Oct' 2020 TO Mar'2021)

	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-20	32.2	537.6	208.7	33.4	463.8	245.2	34.0	449.5	243.0
2-Dec-20	31.7	530.5	220.4	33.8	470.7	249.9	34.0	449.4	242.4
3-Dec-20	32.6	524.8	239.2	34.0	471.3	251.8	34.0	449.1	243.1
4-Dec-20	33.9	530.5	238.6	34.6	479.0	257.5	34.3	452.0	245.9
5-Dec-20	34.6	537.3	238.2	34.2	476.6	254.4	34.6	455.6	251.8
6-Dec-20	33.0	544.4	237.3	32.7	453.8	238.2	33.1	442.9	233.9
7-Dec-20	32.0	542.0	242.5	34.0	466.4	250.7	33.6	445.7	238.1
8-Dec-20	33.6	532.6	258.7	33.5	464.6	246.5	33.6	445.4	237.0
9-Dec-20	32.3	538.6	263.8	33.9	474.0	251.3	33.6	447.1	238.6
10-Dec-20	31.3	533.5	242.2	32.6	449.9	236.5	33.6	446.4	238.6
11-Dec-20	30.3	522.3	220.1	33.7	462.3	248.0	33.8	447.8	240.5
12-Dec-20	29.9	519.0	226.8	33.4	463.4	245.1	33.5	443.9	235.7
13-Dec-20	26.4	534.3	230.8	32.9	455.0	239.7	33.1	440.6	231.0
14-Dec-20	29.0	534.0	224.4	32.2	439.1	231.2	32.8	437.8	227.2
15-Dec-20	30.5	533.2	237.2	33.4	461.9	245.1	33.4	443.1	234.6
16-Dec-20	28.6	523.3	222.8	33.8	469.2	250.1	33.4	443.8	235.9
17-Dec-20	28.5	523.4	220.8	34.1	478.0	254.0	33.8	448.4	241.8
18-Dec-20	32.0	519.4	214.2	34.3	477.1	255.2	34.9	459.2	257.1
19-Dec-20	31.0	523.6	224.3	33.3	462.5	244.6	34.2	455.4	252.0
20-Dec-20	29.8	517.2	224.7	33.0	461.7	242.1	34.2	452.7	248.3
21-Dec-20	30.6	527.8	234.6	33.3	464.4	245.1	33.8	447.9	240.9
22-Dec-20	30.9	526.5	232.2	33.9	470.6	250.3	34.3	451.2	246.2
23-Dec-20	30.6	522.5	230.2	33.7	468.6	248.4	34.2	452.4	247.1
24-Dec-20	30.2	520.9	227.9	33.4	464.1	245.7	33.6	446.3	239.1
25-Dec-20	30.4	516.5	224.2	33.3	457.2	243.5	33.7	445.8	238.4
26-Dec-20	32.0	532.1	213.7	33.4	459.4	244.7	33.2	442.2	233.7
27-Dec-20	27.6	545.1	222.3	33.1	452.7	241.3	33.5	444.1	235.8
28-Dec-20	29.7	532.0	219.4	33.4	459.6	245.3	33.6	445.4	237.9
29-Dec-20	28.0	524.3	220.4	33.3	455.6	243.4	33.5	443.9	236.1
30-Dec-20	28.5	522.5	223.6	33.3	460.9	243.9	33.3	441.7	233.6
31-Dec-20	29.5	520.4	224.1	33.4	457.6	244.1	33.5	442.6	235.6
1-Jan-21	30.3	521.5	214.8	32.9	450.9	239.5	33.2	439.2	230.8
2-Jan-21	30.2	520.6	226.1	32.4	443.9	234.4	32.8	437.8	229.8
3-Jan-21	30.3	525.1	232.2	31.2	421.0	219.6	31.5	422.6	207.0
4-Jan-21	31.1	516.6	240.8	32.2	438.5	231.6	32.2	430.6	218.7
5-Jan-21	31.8	523.3	236.2	32.5	445.1	235.1	32.5	433.2	222.3
6-Jan-21	27.6	519.1	219.7	32.9	448.3	239.0	32.9	439.2	229.5
7-Jan-21	30.3	519.6	219.6	32.1	439.6	230.8	32.2	431.9	219.9
8-Jan-21	29.8	535.8	228.2	31.8	434.8	227.7	32.0	427.8	214.7
9-Jan-21	29.0	531.3	219.2	31.7	429.6	226.0	32.6	433.4	222.2
10-Jan-21	29.6	519.0	213.1	31.0	416.9	217.5	32.1	429.9	217.4
11-Jan-21	29.6	512.0	218.4	32.4	442.9	234.3	32.8	435.2	224.6
12-Jan-21	30.5	524.1	215.8	32.2	441.3	231.2	32.6	433.9	222.6
13-Jan-21	30.9	531.8	216.4	31.9	430.4	227.6	32.3	431.4	219.9
14-Jan-21	31.1	538.7	211.3	31.4	421.5	222.1	31.8	425.6	212.3
15-Jan-21	32.8	524.5	218.2	31.6	422.2	223.6	32.0	427.8	214.6
16-Jan-21	33.2	523.3	231.3	32.1	431.4	230.0	32.0	428.2	215.7
17-Jan-21	33.9	530.1	238.3	31.4	421.6	222.3	31.4	421.2	205.5
18-Jan-21	33.1	524.4	226.6	33.3	453.8	243.1	32.2	429.3	216.4
19-Jan-21	33.2	513.9	211.4	32.9	445.4	238.5	32.8	434.1	222.8
20-Jan-21	33.4	506.3	206.1	33.1	450.4	240.4	32.9	436.9	226.9
21-Jan-21	33.8	509.5	207.3	31.4	419.9	222.1	31.9	426.3	212.4
22-Jan-21	33.9	524.4	217.1	31.4	416.5	221.8	31.7	423.5	208.5
23-Jan-21	34.0	529.6	225.6	31.8	423.0	226.5	31.5	423.3	208.5
24-Jan-21	33.8	535.3	226.1	31.7	424.7	225.3	31.8	426.4	212.2
25-Jan-21	34.0	541.9	225.9	32.7	442.9	236.9	32.0	429.6	216.7
26-Jan-21	33.6	548.7	224.9	31.3	423.8	221.1	31.4	422.0	207.8
27-Jan-21	33.7	530.7	222.0	32.7	450.5	237.7	32.2	431.6	220.9
28-Jan-21	33.5	483.3	214.8	32.3	438.7	232.4	32.1	427.4	214.6
29-Jan-21	34.1	482.0	215.2	32.1	432.7	229.4	32.0	427.2	214.3
30-Jan-21	34.1	481.9	215.7	31.7	429.0	225.7	31.8	424.7	210.8
31-Jan-21	34.1	478.9	216.3	31.8	428.7	227.1	31.6	420.9	205.4

Note : Blank coloum -Unit is in shutdown

Adani Power (Mundra) Limited, Mundra

Continues Environment Monitoring System Reports (April'2020 TO September'2020)

	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-21	33.9	476.4	216.6	32.1	431.4	229.9	32.4	432.2	220.9
2-Feb-21	34.7	470.2	216.5	32.7	442.9	236.1	32.5	433.5	222.0
3-Feb-21	34.5	467.2	217.2	32.1	433.4	229.5	32.3	431.0	218.9
4-Feb-21	33.9	481.1	222.9	31.9	431.7	228.1	32.4	432.8	221.0
5-Feb-21	33.6	501.0	229.8	32.3	438.8	231.6	32.3	430.7	217.4
6-Feb-21	33.2	506.6	231.5	32.3	438.3	231.8	32.4	432.8	221.4
7-Feb-21	33.2	518.2	236.1	30.5	398.0	210.5	31.1	416.8	199.4
8-Feb-21	33.6	509.7	229.3	32.0	431.9	229.0	31.9	426.2	212.8
9-Feb-21	33.4	521.0	235.6	32.4	437.6	232.7	31.9	427.1	213.6
10-Feb-21	33.5	550.0	248.9	32.0	434.2	229.1	32.5	434.4	223.4
11-Feb-21	33.6	540.5	243.3	32.3	438.3	232.1	32.0	429.6	216.6
12-Feb-21	33.3	526.3	234.7	32.3	437.0	232.4	32.2	431.1	219.1
13-Feb-21	33.3	511.6	232.5	31.7	423.7	225.0	31.9	427.3	213.6
14-Feb-21	33.7	505.4	236.0	30.0	389.1	205.5	30.9	415.1	197.3
15-Feb-21	34.1	509.8	227.9	32.3	434.7	231.2	32.3	431.6	218.9
16-Feb-21	33.6	514.4	238.1	32.1	434.1	230.3	32.3	430.5	217.8
17-Feb-21	33.5	517.8	248.0	31.0	412.9	217.8	31.6	423.8	209.6
18-Feb-21	33.3	530.3	235.5	30.9	413.0	216.9	31.5	422.6	206.4
19-Feb-21	33.2	519.9	231.8	31.8	424.4	226.2	32.1	429.8	217.0
20-Feb-21	33.1	517.9	240.9	32.8	451.1	238.2	33.1	445.3	238.1
21-Feb-21	33.2	521.0	243.8	31.1	426.7	220.2	32.5	439.1	229.8
22-Feb-21	33.4	516.5	229.4	32.4	438.7	232.9	32.4	435.8	224.4
23-Feb-21	33.5	479.0	236.7	32.8	446.8	237.4	32.4	432.7	220.4
24-Feb-21	32.1	374.5	249.2	32.8	450.8	238.5	32.6	435.6	224.8
25-Feb-21	35.1	369.5	256.8	33.7	461.7	247.7	31.8	427.0	216.7
26-Feb-21	32.2	439.6	236.4	35.5	493.8	267.6			
27-Feb-21	32.3	408.8	223.2	34.5	482.1	258.0			
28-Feb-21	31.4	335.5	216.5	33.8	474.8	250.7			
1-Mar-21	29.7	391.4	239.5	33.5	466.7	246.8	21.9	335.6	146.6
2-Mar-21	31.6	486.1	235.0	32.3	442.1	233.3	32.7	436.7	225.8
3-Mar-21	33.2	477.2	232.6	32.6	449.7	236.4	33.0	439.8	230.4
4-Mar-21	35.0	500.2	229.2	32.8	451.3	238.2	33.2	441.7	232.9
5-Mar-21	35.3	510.3	225.2	33.4	461.8	244.9	32.9	439.1	229.4
6-Mar-21	34.4	519.7	221.3	34.2	475.4	253.9	33.1	444.0	236.3
7-Mar-21	28.5	519.7	212.9	33.0	453.5	240.5	33.3	442.6	233.6
8-Mar-21	31.7	525.7	227.0	34.1	467.1	251.4	34.0	449.3	242.5
9-Mar-21	34.3	503.1	225.2	34.2	472.4	253.8	34.5	456.5	253.1
10-Mar-21	33.5	495.8	224.5	34.8	484.8	260.5	34.3	453.7	248.8
11-Mar-21	30.8	516.7	219.3	34.9	486.1	261.7	34.6	456.1	252.3
12-Mar-21	38.1	497.9	216.9	35.4	493.2	267.2	34.4	455.1	251.0
13-Mar-21	33.5	491.8	224.0	35.1	488.6	263.4	34.5	457.0	253.7
14-Mar-21	33.0	477.8	231.7	32.8	456.3	239.5	33.4	446.3	239.3
15-Mar-21	34.9	496.9	239.2	34.1	476.0	252.9	34.3	456.0	253.0
16-Mar-21	34.1	511.8	228.5	35.3	491.5	265.8	34.2	455.9	252.0
17-Mar-21	35.0	516.8	225.3	35.8	496.1	270.5	34.4	456.9	252.9
18-Mar-21	37.4	517.5	219.3	35.9	497.7	272.3	34.5	457.7	253.6
19-Mar-21	36.8	522.1	224.6	35.7	496.1	270.4	34.5	457.7	253.4
20-Mar-21	31.1	518.0	216.7	35.1	490.6	263.8	34.4	457.0	253.3
21-Mar-21				35.6	495.9	269.3	34.9	460.0	256.0
22-Mar-21				35.0	489.2	263.0	34.9	459.8	256.0
23-Mar-21				33.2	470.3	245.5	34.8	458.9	255.8
24-Mar-21				31.2	430.3	221.1	21.3	333.5	146.6
25-Mar-21				34.6	485.5	258.9			
26-Mar-21				35.3	492.6	266.2			
27-Mar-21				35.5	493.9	267.9	32.9	439.1	229.4
28-Mar-21				33.5	469.9	247.1	33.5	450.9	245.3
29-Mar-21				32.7	456.7	238.6	32.4	435.6	223.1
30-Mar-21				33.6	471.6	249.0	33.6	451.4	246.7
31-Mar-21	35.5	230.9	468.3	33.3	468.6	246.0	33.8	453.4	250.2

Note : Blank coloum -Unit is in shutdown

Adani Power (Mundra) Limited, Mundra

Continues Environment Monitoring System Reports (Oct' 2020 TO Mar'2021)

	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)
1-Oct-20	33.1	166.2	235.1	31.2	150.4	238.5	33.9	156.1	264.1
2-Oct-20	32.4	163.8	230.0	30.4	149.3	234.9	32.4	148.4	242.8
3-Oct-20	34.4	168.0	239.7	32.4	151.8	242.4	35.9	161.7	277.5
4-Oct-20	33.2	164.9	231.8	30.6	148.6	232.3	33.2	151.1	251.6
5-Oct-20	34.5	168.8	245.2	32.8	153.4	247.1	36.4	164.6	274.0
6-Oct-20	34.7	169.2	247.4	32.9	153.6	246.7	33.4	154.4	248.4
7-Oct-20	33.9	168.4	245.7	32.5	152.1	243.7	35.5	162.2	261.6
8-Oct-20	33.5	168.6	246.7	32.3	152.1	243.6	37.4	168.3	272.0
9-Oct-20	34.5	169.6	249.9	32.3	152.9	246.4	37.9	169.6	274.1
10-Oct-20	34.2	168.2	242.0	32.1	152.3	240.9	36.7	166.0	267.9
11-Oct-20	33.5	167.5	240.3	32.6	152.7	244.3	37.5	169.1	273.3
12-Oct-20	33.4	167.3	241.2	32.4	152.3	242.6	35.1	162.0	261.1
13-Oct-20	33.5	167.5	240.7	32.7	153.5	247.1	34.6	160.6	260.5
14-Oct-20	34.5	169.1	244.6	32.6	153.5	243.2	34.7	160.8	261.2
15-Oct-20	34.9	169.5	245.1	32.8	152.7	250.8	36.2	165.0	268.3
16-Oct-20	37.8	173.3	253.9	33.8	155.2	251.0	36.7	165.7	269.5
17-Oct-20	38.0	172.9	250.8	33.0	154.0	248.1	36.9	166.7	269.5
18-Oct-20	35.7	169.0	240.6	30.5	148.3	230.9	32.6	150.6	242.0
19-Oct-20	34.9	170.0	247.4	32.6	152.6	248.3	34.6	161.4	261.1
20-Oct-20	34.6	170.2	248.9	32.0	152.5	248.5	35.0	162.8	263.9
21-Oct-20	34.9	170.1	249.4	31.8	151.6	245.2	32.8	152.8	243.0
22-Oct-20	34.5	169.0	244.1	32.0	151.5	244.6	32.8	152.0	242.7
23-Oct-20	34.0	167.8	238.9	31.5	150.4	241.7	32.9	153.3	246.2
24-Oct-20	33.5	166.2	235.0	30.9	149.4	237.0	31.6	146.8	234.5
25-Oct-20	33.0	164.2	230.9	31.0	149.7	234.4	29.9	138.7	221.3
26-Oct-20	34.0	166.6	236.8	31.3	150.7	237.0	31.5	146.1	234.8
27-Oct-20	34.2	167.1	240.0	31.1	150.4	237.3	33.5	155.5	250.1
28-Oct-20	34.7	168.5	245.2	31.1	149.3	238.9	33.2	154.0	247.5
29-Oct-20	34.6	168.0	244.9	31.1	150.0	240.6	32.7	151.4	243.6
30-Oct-20	34.5	168.4	239.8	31.0	149.8	235.1	32.6	150.3	241.7
31-Oct-20	35.2	170.9	244.0	31.7	153.0	239.4	32.3	150.7	240.3
1-Nov-20	33.5	165.9	229.6	30.6	150.8	232.1	31.6	147.5	233.8
2-Nov-20	34.5	168.3	239.9	31.3	151.3	238.4	32.7	152.4	244.6
3-Nov-20	35.3	170.5	243.2	32.0	152.9	242.9	32.9	153.9	246.3
4-Nov-20	34.4	169.3	240.3	31.4	152.1	238.8	33.1	155.7	248.2
5-Nov-20	33.9	168.5	239.4	31.1	150.4	239.0	33.2	155.4	249.5
6-Nov-20	34.6	169.4	239.9	31.6	151.5	240.0	32.6	151.7	243.9
7-Nov-20	34.8	170.0	240.2	31.8	151.2	239.1	31.8	147.6	235.8
8-Nov-20	34.9	169.2	237.8	32.3	151.6	239.4	32.4	149.9	240.1
9-Nov-20	34.3	168.6	238.0	31.4	150.8	239.6	31.3	146.2	234.7
10-Nov-20	34.7	168.5	237.1	32.3	152.7	240.1	32.2	149.7	241.4
11-Nov-20	34.8	169.0	238.6	31.7	151.5	237.0	32.3	150.1	241.5
12-Nov-20	35.8	170.7	242.4	32.4	151.8	238.9	33.3	152.6	247.7
13-Nov-20	35.2	169.7	236.7	32.0	151.7	235.8	32.7	151.2	243.9
14-Nov-20	33.0	165.4	227.4	30.3	148.6	227.6	29.8	140.2	222.4
15-Nov-20	31.8	161.9	223.0	28.2	146.1	220.1	27.5	128.6	204.4
16-Nov-20	32.6	161.8	222.7	29.4	147.3	223.2	27.5	127.0	202.1
17-Nov-20	34.1	167.4	234.6	30.1	148.9	231.5	31.3	146.2	235.0
18-Nov-20	35.1	169.7	239.8	31.2	150.1	237.5	32.1	149.6	240.6
19-Nov-20	35.3	168.6	239.9	31.7	151.2	238.6	31.9	149.3	240.4
20-Nov-20	34.9	168.6	237.4	30.9	149.9	234.0	32.1	150.5	242.2
21-Nov-20	35.0	168.6	237.7	30.8	150.7	234.1	32.1	149.9	242.2
22-Nov-20	34.3	167.5	235.2	30.2	148.4	230.5	32.4	151.6	243.4
23-Nov-20	34.9	169.9	241.9	30.8	150.2	235.8	32.7	152.2	245.9
24-Nov-20	34.4	168.2	239.4	31.2	151.4	238.3	33.3	153.7	249.4
25-Nov-20	34.3	167.6	236.4	30.5	149.2	234.2	32.3	148.8	241.4
26-Nov-20	35.1	168.3	236.4	30.6	148.7	231.9	31.8	144.6	234.9
27-Nov-20	36.2	170.7	241.8	31.6	149.8	234.8	32.1	146.9	238.9
28-Nov-20	35.6	168.7	238.6	31.9	151.5	236.4	31.9	146.9	238.1
29-Nov-20	34.8	166.2	233.3	30.9	149.8	231.4	31.6	146.4	235.9
30-Nov-20	35.2	168.0	239.0	31.3	149.9	233.8	32.2	150.4	242.6

Note : Blank coloum -Unit is in shutdown

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Adani Power (Mundra) Limited, Mundra

Continues Environment Monitoring System Reports (Oct' 2020 TO Mar'2021)

	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)
1-Dec-20	34.3	168.7	237.7	30.6	150.3	234.5	33.1	154.1	249.2
2-Dec-20	34.4	168.7	238.5	31.3	151.3	237.0	33.8	157.1	254.8
3-Dec-20	34.7	169.5	240.7	31.0	150.2	236.8	34.0	156.1	253.6
4-Dec-20	34.5	169.8	240.2	31.1	150.8	238.0	33.6	154.6	249.8
5-Dec-20	34.5	169.6	239.4	31.2	150.4	238.6	32.7	151.5	244.5
6-Dec-20	35.1	169.5	237.9	30.5	149.0	233.3	31.8	147.6	237.5
7-Dec-20	35.1	171.1	242.7	31.5	151.6	239.8	32.5	150.9	243.1
8-Dec-20	35.3	170.5	240.1	31.8	151.8	241.8	33.8	156.4	251.1
9-Dec-20	34.9	169.5	236.8	31.2	150.8	236.8	33.3	153.4	247.4
10-Dec-20	34.3	168.7	235.3	30.1	149.2	232.7	32.8	150.8	243.7
11-Dec-20	34.8	168.9	239.4	30.4	149.7	235.1	32.6	148.9	242.0
12-Dec-20	35.0	169.8	236.6	30.9	150.1	235.1	32.1	145.9	237.2
13-Dec-20	36.6	171.5	239.3	30.5	149.3	232.6	31.5	143.9	233.3
14-Dec-20	31.8	159.5	223.0	30.3	149.2	233.5	31.2	143.3	230.7
15-Dec-20	35.0	169.5	240.5	30.6	149.5	237.7			
16-Dec-20	36.3	172.7	246.5	31.7	151.9	241.2			
17-Dec-20	36.0	170.5	243.7	31.7	151.4	240.0			
18-Dec-20	36.0	171.6	243.9	32.1	152.6	242.9			
19-Dec-20	35.8	170.1	241.8	32.0	151.6	239.8			
20-Dec-20	35.6	169.5	240.7	31.0	149.4	232.4			
21-Dec-20	35.7	169.8	242.2	31.2	150.0	236.1			
22-Dec-20	35.3	170.9	243.2	30.8	149.7	236.9			
23-Dec-20	34.5	169.6	239.4	30.6	149.7	237.5			
24-Dec-20	35.0	169.9	239.0	31.1	149.4	236.5			
25-Dec-20				30.7	150.0	236.1	31.1	134.5	214.2
26-Dec-20				30.9	150.4	237.7	31.7	148.5	239.5
27-Dec-20				30.1	148.9	233.0	30.7	143.6	230.9
28-Dec-20				30.4	148.7	234.1	31.3	146.1	234.7
29-Dec-20				30.7	150.0	235.9	31.1	145.9	232.5
30-Dec-20				31.0	149.5	235.4	31.3	145.5	233.3
31-Dec-20				30.9	149.3	236.5	30.9	144.2	230.1
1-Jan-21				28.2	143.6	222.6	30.6	144.2	227.5
2-Jan-21				27.6	142.4	220.0	30.8	144.4	228.9
3-Jan-21				27.6	142.8	221.3	29.0	135.3	213.8
4-Jan-21				27.7	143.0	220.5	29.6	139.3	220.7
5-Jan-21				27.1	143.0	217.4	30.3	141.9	226.1
6-Jan-21				27.7	144.1	217.3	29.8	138.8	219.6
7-Jan-21				27.5	144.1	217.0	29.7	137.4	219.4
8-Jan-21				27.1	143.2	217.2	29.4	134.7	215.2
9-Jan-21				27.2	143.0	216.2	30.2	138.5	221.7
10-Jan-21				27.0	142.9	216.4	28.7	131.1	208.9
11-Jan-21				27.6	143.1	217.1	30.1	138.3	220.5
12-Jan-21				27.6	143.1	216.8	30.0	137.6	220.1
13-Jan-21				27.6	143.7	217.3	30.5	139.9	225.1
14-Jan-21				26.8	142.9	214.0	26.1	121.1	192.6
15-Jan-21				27.8	143.3	217.4	26.1	120.2	192.0
16-Jan-21				27.0	142.8	214.6	26.1	120.2	192.1
17-Jan-21				27.1	142.9	215.3	25.8	119.2	190.6
18-Jan-21				27.0	142.9	214.7	25.9	119.7	191.4
19-Jan-21				27.0	143.2	215.5	26.1	120.2	191.8
20-Jan-21				27.6	143.5	217.6	26.0	120.0	191.3
21-Jan-21				27.1	143.4	214.5	26.1	120.6	192.5
22-Jan-21				27.4	143.2	217.7	25.9	119.9	192.0
23-Jan-21				27.4	143.9	215.6	25.7	118.7	190.0
24-Jan-21				27.2	142.9	213.8	25.7	118.2	188.7
25-Jan-21				27.3	143.4	212.5	25.8	118.5	188.6
26-Jan-21				27.0	143.1	211.2	25.6	118.6	187.8
27-Jan-21				27.4	142.4	215.3	25.5	118.2	187.2
28-Jan-21				27.7	143.7	216.9	25.7	118.5	188.1
29-Jan-21				27.9	144.1	218.7	26.1	119.4	197.6
30-Jan-21				27.2	143.4	214.1	25.8	118.8	216.9
31-Jan-21				26.6	143.2	213.9	25.6	118.5	217.2

Note : Blank coloum -Unit is in shutdown

Adani Power (Mundra) Limited, Mundra

Continues Environment Monitoring System Reports (April'2020 TO September'2020)

	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)
1-Feb-21				26.5	142.9	214.2	25.1	117.1	216.6
2-Feb-21				27.1	143.3	216.8	25.6	118.6	217.8
3-Feb-21				26.2	142.8	212.8	25.1	117.0	217.1
4-Feb-21				26.3	143.1	213.4	25.5	118.6	218.0
5-Feb-21				26.7	143.0	214.3	25.6	117.8	216.9
6-Feb-21				28.1	144.6	218.4	25.5	116.4	215.4
7-Feb-21				27.9	144.3	214.6	25.6	116.9	216.0
8-Feb-21				27.0	143.2	214.2	25.4	117.3	216.7
9-Feb-21				27.2	143.3	215.3	25.5	117.8	217.2
10-Feb-21				26.3	142.7	212.2	25.6	118.6	218.1
11-Feb-21				26.6	143.4	213.4	25.5	118.6	218.1
12-Feb-21				26.4	143.2	213.6	25.6	119.4	218.8
13-Feb-21				26.8	143.4	213.2	25.7	119.3	218.6
14-Feb-21				26.4	142.7	212.9	25.6	118.7	218.3
15-Feb-21				26.5	143.2	212.1	25.7	118.9	218.4
16-Feb-21				26.5	142.3	211.5	25.5	118.3	218.0
17-Feb-21				26.5	143.2	212.1	25.5	117.1	217.0
18-Feb-21				26.5	143.5	210.6	25.5	118.6	217.9
19-Feb-21				27.3	144.6	210.7	25.3	117.5	215.8
20-Feb-21				27.1	143.1	211.2	26.6	117.8	215.6
21-Feb-21				27.1	143.4	212.5	30.6	118.6	216.3
22-Feb-21				26.3	143.5	205.6	30.4	121.6	212.6
23-Feb-21				26.4	146.6	209.2	28.6	132.3	220.5
24-Feb-21				26.7	149.5	225.8	27.1	140.5	239.5
25-Feb-21				27.4	151.2	234.1	26.7	139.1	237.3
26-Feb-21				27.4	151.4	230.2	27.3	141.4	240.8
27-Feb-21				26.6	149.6	226.5	27.2	141.2	240.4
28-Feb-21				26.9	151.0	227.7	31.0	154.5	261.7
1-Mar-21							38.6	185.6	280.5
2-Mar-21							38.0	174.2	259.8
3-Mar-21							38.8	175.7	266.2
4-Mar-21							39.5	176.3	267.3
5-Mar-21							41.0	183.3	275.8
6-Mar-21							40.0	180.2	271.2
7-Mar-21							38.9	176.9	265.1
8-Mar-21							40.0	182.2	273.4
9-Mar-21							38.9	177.2	267.1
10-Mar-21							39.3	179.0	268.0
11-Mar-21							38.4	176.2	264.5
12-Mar-21							38.8	177.6	266.0
13-Mar-21							39.1	177.4	267.9
14-Mar-21							38.0	172.6	260.5
15-Mar-21							39.3	180.2	268.9
16-Mar-21							39.2	178.6	268.9
17-Mar-21							39.9	181.5	272.7
18-Mar-21							39.6	181.2	271.4
19-Mar-21							39.7	181.1	271.7
20-Mar-21							39.7	180.7	271.1
21-Mar-21							39.3	178.9	268.3
22-Mar-21							39.6	180.6	271.6
23-Mar-21							39.3	180.8	269.1
24-Mar-21	31.0	167.0	236.4				37.4	171.2	258.6
25-Mar-21	33.2	171.7	244.8				39.1	180.6	267.1
26-Mar-21	33.8	171.9	249.4				37.7	180.7	268.4
27-Mar-21	33.5	171.0	248.8				33.2	180.1	267.7
28-Mar-21	30.5	163.7	228.9				33.2	178.7	266.3
29-Mar-21	29.2	158.4	220.6				28.4	149.2	238.3
30-Mar-21	31.3	166.3	232.1				33.3	170.4	260.7
31-Mar-21	31.5	167.5	234.3				33.2	171.2	261.3

Note : Blank coloum -Unit is in shutdown

adani

Terrestrial Ecology Report (October 2020 to March 2021)

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 2020 to March 2021** in two different seasons comprising Post monsoon and Winter seasons 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 **Fig. 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' 22.72" E 69° 33' 46.62"
2	Near Tunda Village	1.5	N 22° 50' 13.50" E 69° 32' 2.45"
3	Near Kandagra Village	3.0	N 22° 50' 22.01" E 69° 31' 33.35"
4	Near Navinal Creek	8.5	N 22° 48' 12.66" E 69° 37' 57.37"
5	Near Vandh Village	0.5	N 22° 48' 44.94" E 69° 32' 33.04"
6	Near Desalpar Village	7.0	N 22° 52' 50.91" E 69° 34' 45.99"
7	Common Intake Channel area	3.8	N 22° 47' 31.21" E 69° 32' 10.63"
8	Outfall Channel and Kotdi creek area	3.5	N 22° 48' 4.62" E 69° 34' 33.98"

Fig. 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.

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* **(Plate 2)** *Indigofera cordifolia, Suaeda fruticosa, Suaeda nudiflora, Solanum xanthocarpum, Tridax procumbens, Sporolobus maderaspatenus* etc.

Plate 1: ***Datura stramonium***

Plate 2: ***Ipomoea biloba***

Plate 3: ***Calotropis procera***

Plate 4: ***Aeluropus lagopoides***

Plate 5: ***Citrulus colocynthis***

Plate 6: ***Leptochloa fusca***

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).

The Importance Value Index (IVI) for trees varies between 23.94 and 49.93. The highest IVI of studied tree recorded in study area is of *Cocos nucifera* (49.93) and lowest IVI recorded is of *Casuarina equisetifolia* (23.94) during study period. For shrubs, IVI varies between 10.47 and 28.04. The highest IVI of studied shrubs recorded in study area is of *Cassia auriculata* (28.04) and lowest IVI recorded is of *Zizyphus mauritiana* (9.95) during study period. The undergrowth vegetation (herbs) shows IVI in between 12.72 and 31.74. The highest IVI of studied herbs recorded in study area is of *Salicornia brachiata* (31.74) and lowest IVI recorded is of *Boerrhavia diffusa* (12.72) 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:

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

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 **2.19, 2.23** 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	4	14	52	8.27	16.55	0.02	140	12.17	0.22	5.29	0.4	8.51	25.98	0.1217	-2.1059	0.26
Azadiracta indica	NE	5	11	74	11.78	23.55	0.04	110	9.57	0.44	10.72	0.5	10.64	30.92	0.0957	-2.3470	0.22
Borassus flabellifer	NE	5	13	91	14.48	28.96	0.07	130	11.30	0.66	16.21	0.5	10.64	38.15	0.1130	-2.1800	0.25
Casuarina equisetifolia	NE	5	14	24	3.82	7.64	0.00	140	12.17	0.05	1.13	0.5	10.64	23.94	0.1217	-2.1059	0.26
Cocos nucifera	NE	6	16	109	17.35	34.69	0.09	160	13.91	0.95	23.25	0.6	12.77	49.93	0.1391	-1.9723	0.27
Mangifera indica	DD	4	11	61	9.71	19.41	0.03	110	9.57	0.30	7.28	0.4	8.51	25.36	0.0957	-2.3470	0.22
Phoenix dactylifera	NE	5	14	109	17.35	34.69	0.09	140	12.17	0.95	23.25	0.5	10.64	46.06	0.1217	-2.1059	0.26
Prosopis juliflora	NE	9	11	41	6.52	13.05	0.01	110	9.57	0.13	3.29	0.9	19.15	32.00	0.0957	-2.3470	0.22
Salvadora persica	NE	4	11	70	11.14	22.28	0.04	110	9.57	0.39	9.59	0.4	8.51	27.66	0.0957	-2.3470	0.22
Total			**115**					**1150**	**100.00**	**4.07**	**100.00**	**4.7**	**100.00**	**300.00**			**2.19**
																Shannon-Wiener	**2.19**

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	7.91	0.90	13.85	21.76	0.0791	-2.5366	0.20
Calotropis gigantea	NE	8	10	25	7.19	0.80	12.31	19.50	0.0719	-2.6319	0.19
Calotropis procera	NE	9	15	38	10.79	0.90	13.85	24.64	0.1079	-2.2264	0.24
Capparis deciduas	NE	8	11	28	7.91	0.80	12.31	20.22	0.0791	-2.5366	0.20
Cassia auriculata	NE	7	24	60	17.27	0.70	10.77	28.04	0.1727	-1.7564	0.30
Euphorbia spp.	NE	7	13	33	9.35	0.70	10.77	20.12	0.0935	-2.3695	0.22
Tamarix dioica	NE	5	19	48	13.67	0.50	7.69	21.36	0.1367	-1.9900	0.27
Thevetia peruviana	NE	6	10	25	7.19	0.60	9.23	16.43	0.0719	-2.6319	0.19
Zizyphus mauritiana	NE	4	6	15	4.32	0.40	6.15	10.47	0.0432	-3.1427	0.14
Zizyphus numularia	NE	2	20	50	14.39	0.20	3.08	17.47	0.1439	-1.9387	0.28
		Total	**139**	**348**	**100.00**	**6.50**	**100.00**	**200.00**			**2.23**
										Shannon-Wiener	**2.23**

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	5	14	0.14	8.05	0.5	11.63	19.67	0.0805	-2.5200	0.20
Aloe vera	NE	6	15	0.15	8.62	0.6	13.95	22.57	0.0862	-2.4510	0.21
Boerrhavia diffusa	NE	3	10	0.10	5.75	0.3	6.98	12.72	0.0575	-2.8565	0.16
Citrullus colocynthis	NE	5	16	0.16	9.20	0.5	11.63	20.82	0.0920	-2.3865	0.22
Ipomoea biloba	NE	2	17	0.17	9.77	0.2	4.65	14.42	0.0977	-2.3258	0.23
Salicornia brachiata	NE	5	35	0.35	20.11	0.5	11.63	31.74	0.2011	-1.6037	0.32
Solanum xanthocarpum	NE	4	8	0.08	4.60	0.4	9.30	13.90	0.0460	-3.0796	0.14
Indigofera cordifolia	NE	4	15	0.15	8.62	0.4	9.30	17.92	0.0862	-2.4510	0.21
Sporolobus maderaspatenus	NE	3	26	0.26	14.94	0.3	6.98	21.92	0.1494	-1.9010	0.28
Suaeda fruticosa	NE	6	18	0.18	10.34	0.6	13.95	24.30	0.1034	-2.2687	0.23
Tridax procumbens	NE	5	14	0.14	8.05	0.5	11.63	19.67	0.0805	-2.5200	0.20
		Total	**174**	**1.74**	**100.00**	**4.3**	**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-7** 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.**

Garden lizard (*Calotes versicolor*)

Monitor lizard (*Varanus spp.*)

Plate 7: Reptiles recorded the Study Area of 10 Km

Table 5: Fauna Observed in the Study Area

Sr. No.	Common Name	Scientific Name	IUCN Category	Wildlife Schedule
Mammals				
1	Nilgai/ Blue Bull	*Boselaphus tragocamelus*	LC	Schedule III
2	Jackal	*Canis aureus*	LC	Schedule II: Part - II
3	Common Mongoose	*Herpestes edwardsii*	LC	Schedule II: Part - II
4	Indian Hare	*Lepus nigricollis*	LC	Schedule IV

5	Indian Wild Boar	*Sus scrofa*	LC	Schedule III
6	Camel	*Camelus bactrianus*	LC	Schedule IV
7	Fluvous Fruit Bat	*Rousettus leschenaulti*	LC	Schedule IV
Amphibians				
1	Indian Skipping Frog	*Euphlyctis cyanophlyctis*	LC	-
2	Indian bullfrog	*Hoplobatrachus tigerinus*	LC	-
Reptiles				
1	Garden lizard	*Calotes versicolor*	NE	-
2	Monitor lizard	*Varanus spp.*	LC	Schedule II: Part – II
3	Fan-throated lizard	*Sitana ponticeriana*	LC	-
4	Indian cobra	*Naja naja*	LC	Schedule II: Part – II
5	Python	*Python molurus*	NT	Schedule I: Part – II
6	Mojave fringe-toed lizard	*Uma scoparia*	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 2020 to March 2021**. 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:

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

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 8 to 12)**. 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 **3.83** during this period. The Species richness for the study area is found to be **74.** Proportional abundance of the individual species varies between 0.0002 and 0.0476. The highest abundance recorded was of **House Sparrow** (0.0476) and the lowest recorded were of **Southern Grey Shrike** (0.0002) which is observed in study area for the first time ever. The details are presented in **Table 6**.

Great White Pelican (*Pelecanus onocrotalus*)

Little Cormorant (*Microcarbo niger*)

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

Black-Shouldered Kite (*Elanus caeruleus*)

Black-necked Stork-Juvenile (*Ephippiorhynchus asiaticus*)

Desert Wheatear (*Oenanthe deserti*)

Southern Grey Shrike (*Lanius meridionalis*)

Eurasian Spoonbill (*Numenius phaeopus*)

Great stone-curlew (*Esacus recurvirostris*)

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

Green Bee Eater (***Merops orientalis***)

Grey Francolin (***Francolinus pondicerianus***)

Black-headed ibis (***Threskiornis melanocephalus***)

Common Crane (***Grus grus***)

Demoiselle crane (***Anthropoides virgo***)

Darter (***Anhinga melanogaster***)

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

Painted Stork (*Mycteria leucocephala*)

Gull-Billed tern (*Gelochelidon nilotica*)

Black-Winged Stilt (*Himantopus himantopus*)

Dalmatian Pelican (*Pelecanus crispus*)

Greater Flamingo (*Phoenicopterus roseus*)

Little tern (*Sternula albifrons*)

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

Spot billed duck (*Anas poecilorhyncha*)

Common Greenshank (*Tringa nebularia*)

Common Coot (*Fulica atra*)

Greater Short-toed Lark (*Calandrella brachydactyla*)

Eurasian Whimbrel (*Platalea leucorodia*)

Eurasian Curliew (*Numenius arquata*)

Plate 12: 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	37	0.0057	-5.162	0.0296
2	Black-Tailed Godwit	*Limosa limosa*	NT	Schedule IV	4	0.0006	-7.386	0.0046
3	Black-crowned sparrow-lark	*Eremopterix nigriceps*	LC	Schedule IV	70	0.0108	-4.524	0.0491
4	Black Drongo	*Dicrurus macrocercus*	LC	Schedule IV	121	0.0187	-3.977	0.0745
5	Black Headed Gull	*Chroicocephalus ridibundus*	LC	Schedule IV	125	0.0194	-3.944	0.0764
6	Black Ibis/Glossy Ibis	*Pseudibis papillosa*	LC	Schedule IV	83	0.0129	-4.354	0.0560
7	Black-necked Stork	*Ephippiorhynchus asiaticus*	NT	Schedule IV	38	0.0059	-5.135	0.0302
8	Black-Winged Stilt	*Himantopus himantopus*	LC	Schedule IV	158	0.0245	-3.71	0.0908
9	Black-Shouldered Kite	*Elanus caeruleus*	LC	Schedule IV	45	0.0070	-4.966	0.0346
10	Blue Cheeked Bee Eater	*Merops persicus*	LC	Schedule IV	89	0.0138	-4.284	0.0591
11	Blue Rock Pigeon	*Columba livia neglecta*	NE	Schedule IV	293	0.0454	-3.093	0.1404
12	Brahminy Starling	*Sturnia pagodarum*	NE	Schedule IV	35	0.0054	-5.217	0.0283
13	Cattle Egret	*Bubulcus ibis*	LC	Schedule IV	202	0.0313	-3.464	0.1084
14	Common Babbler	*Turdoides caudata*	LC	Schedule IV	135	0.0209	-3.867	0.0809
15	Common Coot	*Fulica atra*	LC	Schedule IV	185	0.0287	-3.552	0.1018
16	Common Crane	*Grus grus*	LC	Schedule IV	159	0.0246	-3.704	0.0912
17	Common Crested Lark	*Galerida cristata*	LC	Schedule IV	56	0.0087	-4.747	0.0412
18	Common Hoopoe	*Upupa epops*	LC	Schedule IV	32	0.0050	-5.307	0.0263
19	Common Iora	*Aegithina tiphia*	LC	Schedule IV	33	0.0051	-5.276	0.0270
20	Common Myna	*Acridotheres tristis*	LC	Schedule IV	75	0.0116	-4.455	0.0518
21	Common Quail	*Coturnix coturnix*	LC	Schedule IV	43	0.0067	-5.012	0.0334
22	Common Redshank	*Tringa totanus*	LC	Schedule IV	77	0.0119	-4.429	0.0528
23	Common Greenshank	*Tringa nebularia*	LC	Schedule IV	93	0.0144	-4.24	0.0611
24	Common Swallow	*Hirundo rustica*	LC	Schedule IV	107	0.0166	-4.1	0.0680
25	Common Teal	*Anas crecca*	LC	Schedule IV	122	0.0189	-3.969	0.0750
26	Dalmatian Pelican	*Pelecanus crispus*	LC	Schedule IV	127	0.0197	-3.929	0.0773
27	Demoiselle crane	*Anthropoides virgo*	LC	Schedule IV	182	0.0282	-3.569	0.1006
28	Great White Pelican	*Pelecanus onocrotalus*	LC	Schedule IV	96	0.0149	-4.208	0.0626
29	Desert Wheatear	*Oenanthe deserti*	LC	Schedule IV	74	0.0115	-4.469	0.0512
30	Great Stone Plover	*Esacus recurvirostris*	NT	Schedule IV	148	0.0229	-3.776	0.0866
31	Eurasian Collared Dove	*Streptopelia decaocto*	LC	Schedule IV	137	0.0212	-3.853	0.0818
32	Eurasian Curlew	*Numenius arquata*	NT	Schedule IV	17	0.0026	-5.94	0.0156
33	Eurasian Whimbrel	*Platalea leucorodia*	LC	Schedule IV	88	0.0136	-4.295	0.0585
34	Eurasian Spoonbill	*Numenius phaeopus*	LC	Schedule IV	70	0.0108	-4.524	0.0491
35	Greater Flamingo	*Phoenicopterus roseus*	LC	Schedule IV	128	0.0198	-3.921	0.0777
36	Greater Short-toed Lark	*Calandrella brachydactyla*	LC	Schedule IV	48	0.0074	-4.902	0.0364
37	Green Bee Eater	*Merops orientalis*	LC	Schedule IV	104	0.0161	-4.128	0.0665
38	Green Sandpiper	*Tringa ochropus*	LC	Schedule IV	29	0.0045	-5.405	0.0243

39	Grey Heron	*Ardea cinerea*	LC	Schedule IV	71	0.0110	-4.51	0.0496
40	Grey Francolin	*Francolinus pondicerianus*	LC	Schedule IV	87	0.0135	-4.307	0.0580
41	Gull-Billed tern	*Gelochelidon nilotica*	LC	Schedule IV	95	0.0147	-4.219	0.0621
42	Heuglin's Gull	*Larus heuglini*	LC	Schedule IV	64	0.0099	-4.614	0.0457
43	House Crow	*Corvus splendens*	LC	Schedule V	118	0.0183	-4.002	0.0731
44	House Sparrow	*Passer domesticus*	LC	Schedule IV	307	0.0476	-3.046	0.1448
45	Indian Pond Heron	*Ardeola grayii*	LC	Schedule IV	64	0.0099	-4.614	0.0457
46	Indian Robin	*Saxicoloides fulicatus*	LC	Schedule IV	44	0.0068	-4.989	0.0340
47	Indian Roller/ Neelkanth	*Coracias benghalensis*	LC	Schedule IV	51	0.0079	-4.841	0.0382
48	Isabelline shrike	*Lanius isabellinus*	LC	Schedule IV	2	0.0003	-8.08	0.0025
49	Large Egret	*Ardea alba*	LC	Schedule IV	129	0.0200	-3.913	0.0782
50	Laughing Dove	*Spilopelia senegalensis*	LC	Schedule IV	114	0.0177	-4.037	0.0713
51	Little Cormorant	*Microcarbo niger*	LC	Schedule IV	112	0.0173	-4.054	0.0703
52	Little Tern	*Sternula albifrons*	LC	Schedule IV	105	0.0163	-4.119	0.0670
53	Little Stint	*Calidris minuta*	LC	Schedule IV	9	0.0014	-6.576	0.0092
54	Northen Pintail	*Anas acuta*	LC	Schedule IV	70	0.0108	-4.524	0.0491
55	Oriental White Ibis / Black-Headed ibis	*Threskiornis melanocephalus*	NT	Schedule IV	73	0.0113	-4.482	0.0507
56	Osprey	*Pandion haliaetus*	LC	Schedule IV	2	0.0003	-8.08	0.0025
57	Painted Stork	*Mycteria leucocephala*	NT	Schedule IV	211	0.0327	-3.421	0.1118
58	Pied Kingfisher	*Ceryle rudis*	LC	Schedule IV	24	0.0037	-5.595	0.0208
59	Purple Sunbird	*Nectarinia asiatica*	LC	Schedule IV	91	0.0141	-4.262	0.0601
60	Red Vented Bulbul	*Pycnonotus cafer*	LC	Schedule IV	134	0.0208	-3.875	0.0804
61	Red Wattled Lapwing	*Vanellus indicus*	LC	Schedule IV	88	0.0136	-4.295	0.0585
62	Ring Dove	*Streptopelia capicola*	LC	Schedule IV	65	0.0101	-4.598	0.0463
63	Rose-Ringed Parakeet	*Psittacula krameri*	LC	Schedule IV	75	0.0116	-4.455	0.0518
64	Shikra	*Accipiter badius*	LC	Schedule IV	16	0.0025	-6	0.0149
65	Small Blue (Common) Kingfisher	*Alcedo atthis*	LC	Schedule IV	48	0.0074	-4.902	0.0364
66	Snake Bird/ Darter	*Anhinga melanogaster*	NT	Schedule IV	9	0.0014	-6.576	0.0092
67	Spot billed duck	*Anas poecilorhyncha*	LC	Schedule IV	97	0.0150	-4.198	0.0631
68	Southern Grey Shrike	*Lanius meridionalis*	VU	Schedule IV	1	0.0002	-8.773	0.0014
69	Western Reef Heron	*Egretta gularis*	LC	Schedule IV	61	0.0094	-4.662	0.0440
70	White Breasted Kingfisher	*Halcyon smyrnensis*	LC	Schedule IV	52	0.0081	-4.822	0.0388
71	White Wagtail	*Motacilla alba*	LC	Schedule IV	67	0.0104	-4.568	0.0474
72	White-Eared Bulbul	*Pycnonotus leucotis*	LC	Schedule IV	80	0.0124	-4.391	0.0544
73	White-Throated Munia	*Lonchura malabarica*	LC	Schedule IV	84	0.0130	-4.342	0.0565
74	Wire-tailed Swallow	*Hirundo smithii*	LC	Schedule IV	71	0.0110	-4.51	0.0496
Total					**6456**			**3.83**
Shannon Wiener Index								**3.83**

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 2020 to March 2021 total 262.35 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 2020 to March 2021 total 3001 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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adani

MARINE MONITORING REPORT

March– 2021(Pre Monsoon)

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 plant at Mundra near village Tunda&Siracha, Taluka Mundra District Kutch, Gujarat has entrusted the work of carrying out Marine Monitoring to **M/s. UniStar Environment and Research Labs Pvt. Ltd., Vapi.**

Adani Power (Mundra) Limited has commissioned the first supercritical 660 MW unit in the country, engaged in imported coal based thermal power plant with capacity of 4620 MW at Mundra near village Tunda & Siracha, Taluka Mundra District Kutch, Gujarat. Has entrusted the work of carrying out Marine Monitoring to **M/S.UniStar Environment and Research Labs Pvt. Ltd., Vapi.**

The marine monitoring involves Physio-chemical and biological analysis of Marine water. Marine water quality of Sub-tidal and Intertidal regions, Flora and Fauna analysis in marine water area and Benthos in inter-tidal and sub-tidal analysis for the coastal area near Adani Power plant (Mundra) Limited. Water sample are collected from five location (station) and Benthos sample are collected from High water and low water transect area. Samples are brought to the laboratory by field sampling team and the analysis was carried out in our laboratory and the results are presented in this report.

These Marine Monitoring reports provide a data obtained from monitoring and analysis activities undertaken during (Pre monsoon) March 2021.

Date: 22/03/2021

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)**

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INTRODUCTION

1.1 Background

Adani Power (Mundra) Limited (APMuL) is engaged in imported coal based thermal power plant with capacity of 4620 MW at Mundra near village Tunda&Siracha, Taluka Mundra District Kutch, Gujarat.

Adani Power (Mundra) Limited (APMuL) is largest single location private coal based power plant in the world it is created history by synchronizing the first super-critical technology based 660MW generating unit at Mundra. 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 'Clean Development Mechanism (CDM) Project' certification from United Nations Framework Convention on Climate Change (UNFCCC). This is the world's first thermal project based on supercritical technology to be registered as CDM Project under UNFCCC.

Adani Power (Mundra) Limited (APMuL) assessing marine environment it involves Physio-chemical and biological analysis of Marine water. Marine water quality of Sub-tidal and Intertidal regions, Flora Phytoplankton's and Phytopigments and Fauna analysis in marine water area it includes Zooplanktons, Benthos in inter-tidal and sub-tidal analysis for the coastal area near power plant marine outfall water mixing and Sea intake, with special reference to intake channel and seawater discharge.

This report is prepare by the **M/S.UniStar Environment and Research Labs Pvt. Ltd**., at the instance of APMuL and addresses the marine environmental issues related to the APMuL's operational power plant.

1.2 Objectives:

a) Physico chemical seawater parameter to be analyzed for understands the water quality in study area.

b) Sediment samples will be analyzed for estimate selected trace metals.

c) The prevailing marine biological status of the study area is evaluated based on the quantitative and qualitative data on marine life namely Phytoplankton, zooplankton, Chlorophyll & Pheophytin, Sub-tidal/ intertidal Macro benthos.

d) To recommend adequate marine environmental management measures

1.3 Study program:

Period:

The field investigation is completed during March 2021 and sampling team was planned in such a manner so as to get a detailed picture of the marine environment characteristics of the study area and Sampling and analysis for marine environment has been carried out by **M/S.UniStar Environment and Research Labs Pvt. Ltd**.

Study Station locations:

A total of five subtidal station and three intertidal transects was selected for the sampling, here we are given exact location and their position were sampled.

Table 1: Station locations and co ordinates

Subtidal Station			
Station	**Locations**	**Co ordinates**	
1	Intake point	22°48’ 30.’50”N	69°32’57.84”E
2	Mouth of intake point	22°47’07.20”N	69°32’06.50”E
3	West port area	22°45’27.70”N	69°34’50.63”E
4	Outfall area	22°44’ 40.56”N	69°36’26.61”E
5	Outfall area	22°45’12.60”N	69°36’44.54”E

Intertidal transect			
I	High Tide water level	22°47’07.55” N	69°32’16.91” E
	Low Tide water level	22°47’06.38”N	69°32’11.62”E
II	High Tide water level	22°45’58.72” N	69°34’35.41” E
	Low Tide water level	22°45’57.74” N	69°34’35.05” E
III	High Tide water level	22°44’ 52.21” N	69°36’41.64”E
	Low Tide water level	22°44’ 51.23” N	69°36’39.28” E

Figure 1.1: Study marine stations location map

1.4 Sampling

a) Sampling frequency:

All Sampling subtidal stations were monitored during flood to ebb. Water samples were collected in duplicate (surface and bottom) for assessing water quality and marine biological characteristics.

Intertidal sampling was completed during low tide, for assessed Macro benthic fauna samples were collect in duplicate from each transects.

b) Sampling methodology:

- Niskin (5 litre capacity) with a mechanism for closing at a desired depth using messenger was used for collecting sub–surface water samples. Sampling at the surface was done using a clean polyethylene bucket. Known volume of water sample (1 L) was preserved with 4% Lugol's iodine solution.
- For the analysis of Benthos, sub tidal sediment samples were collected using Van-veen grab covering an area of 0.04 m^2. Intertidal samples were collected using metal quadrant. Samples were sieved with 500 µ metal sieve and preserved with Rose Begal-Formalin solution.
- For Zooplankton oblique hauls were made using Heron Tranter net attached with calibrated flow meter. After collection, samples were preserved with 5% formalin.

C) Methods of analysis:

I) Physicochemical Parameter: Samples were analyses by using analytical methods for estimations of Temperature, Turbidity, PH, SS, Salinity, DO, BOD, COD, Phosphate, Total nitrogen, Nitrite, Nitrate, Phenols and PHc.

II) Intertidal & Sub-tidal sediment Quality Parameters are: Texture, Petroleum Hydrocarbon(PHc), Phosphorus, Organic Carbon, Aluminium, Iron, Chromium, Nickel, Zinc, Lead, Copper, Cobalt, Cadmium, Mercury, Arsenic

II) Biological Samples: Phytoplankton, Zooplankton and Macro benthos.

a) Phytoplankton: Sample for cell count was preserved in Lugol's iodine solution, and identification of phytoplankton was done under a compound microscope using Sedgwick Rafter slide.

b) Chlorophyll: For the estimation of chlorophyll *a* and Pheophytin, the extinction of the acetone extract was measured using Turner Flurometer before and after treatment with dilute acid respectively.

c) Zooplankton: Volume (biomass) was obtained by displacement method. A portion (25-50 %) of the sample was analyzed under a microscope for faunal composition and population count.

d) Benthos: The total Macro benthos population (sub tidal & intertidal) was estimated as number of 1 m^2 area and biomass on wet weight basis.

WATER QUALITY

2.1 Marine Water quality:

Sea water samples have been collected during March 2021 (Pre Monsoon)

From Five locations, which are listed in Table 2

Table 2: Water sampling locations, March 2021(Pre Monsoon)

Station no.	Location	Tide
1	Intake point	Flood
2	Intake point	Ebb to Flood
3	West port area	Flood to Ebb
4	Outfall area	Flood
5	Outfall area	Flood to Ebb

2.2 Physico chemical Water analysis result:

All the water sampled, which is collected by sampling team is brought to the lab for Physico chemical analysis. The marine water quality at different collected stations are measured during this investigation is presented in Table No.3

Table: 3 Physico chemical Water Analysis Result

Sr. No.	Parameters	Station 1		Station 2		Test Method Permissible
		Surface	Bottom	Surface	Bottom	
PHYSICAL QUALITY						
1.	pH @ 25 ° C	7.92	7.90	7.91	7.94	IS 3025(Part 11)1983
2.	Temperature (^{0}C)	29.5	29	30	29.5	IS 3025(Part 9)1984
3.	Turbidity (NTU)	1	1	1	1	IS 3025(Part 10)1984
CHEMICAL QUALITY						
1.	Total Suspended Solids (mg/l)	38	32	35	31	(APHA 23rd Ed.,2017,2540- D)
2.	Biochemical Oxygen Demand (BOD) (mg/l)	5.4	4.7	5.2	5.1	IS 3025(Part 44)1993Amd.01
3.	Sulphate as SO_4(mg/l)	3125	2985	3075	3021	(APHA 23rd Ed.,2017,4500- SO4 E)
4.	Ammonical Nitrogen(µmol/l)	2.8	0.8	0.6	0.9	(APHA 23rd Ed.,2017,4500- NH3 B)
5.	Salinity (ppt)	38.0	38.5	37.9	38.2	By Calculation
6.	Dissolved Oxygen (mg/l)	5.2	5.1	5.6	5.8	IS 3025(Part 38)1989,
7.	Total Nitrogen (µmol/l)	13.5	15.2	16.4	16.3	(APHA 23rd Ed.,2017,4500-O,B),
8.	PO_4^3-P (µmol/l)	0.8	0.9	1.2	1.4	APHA 23rd Ed.,2017,4500 NH3 - B
9.	(NO_3-N)e (µmol/l)	1.2	0.9	0.4	0.3	(APHA 23rd Ed.,2017,4500-P,D)
10.	(NO_2-N)Nitrite (µmol/l)	0.4	0.6	0.8	0.5	(APHA 23rd Ed.,2017,4500 NO3-B)
11.	Phenol(µmol/l)	9.4	10.2	11.5	12.8	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

Sr. No	Parameters	Station 3		Station 4		Test Method Permissible
		Surface	Bottom	Surface	Bottom	
PHYSICAL QUALITY						
1.	pH @ 25 ° C	8.02	7.95	8.08	8.01	IS 3025(Part 11)1983
2.	Temperature ^{0}C	30	29	30	29	IS 3025(Part 9)1984
3.	Turbidity (NTU)	1	1	1	5	IS 3025(Part 10)1984
CHEMICAL QUALITY						
1.	Total Suspended Solids (mg/l)	38	36	42	46	(APHA 23rd Ed.,2017,2540-D)
2.	Biochemical Oxygen Demand (BOD) (mg/l)	4.8	6.4	4.7	7.6	IS 3025(Part 44)1993Amd.01
3.	Sulphate as SO_4(mg/l)	2725	2276	2911	3171	(APHA 23rd Ed.,2017,4500-SO4 E)
4.	Ammonical Nitrogen(µmol/l)	2.2	2.4	2.5	2.1	(APHA 23rd Ed.,2017,4500-NH3 B)
5.	Salinity (ppt)	39.5	39.7	37.5	37.9	By Calculation
6.	Dissolved Oxygen (mg/l)	5.6	5.4	6.0	5.7	IS 3025(Part 38)1989,
7.	Total Nitrogen (µmol/l)	7.6	6.1	7.5	6.8	(APHA 23rd Ed.,2017,4500-O,B),
8.	PO_4^3-P (µmol/l)	0.13	0.12	0.8	0.86	APHA 23rd Ed.,2017,4500 NH3 - B
9.	(NO_3-N)e (µmol/l)	0.6	0.3	0.2	0.4	(APHA 23rd Ed.,2017,4500-P,D)
10.	(NO_2-N)Nitrite (µmol/l)	0.5	0.9	0.4	0.6	(APHA 23rd Ed.,2017,4500 NO3-B)
11.	Phenol(µmol/l)	6.7	8.2	4.5	7.3	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

Sr. No.	Parameters	Station 5		Test Method Permissible
		Surface	Bottom	
PHYSICAL QUALITY				
1.	pH @ 25 ° C	8.01	8.03	IS 3025(Part 11)1983
2.	Temperature (^{0}C)	30	29.5	IS 3025(Part 9)1984
3.	Turbidity (NTU)	1	1	IS 3025(Part 10)1984
CHEMICAL QUALITY				
1.	Total Suspended Solids	34	36	(APHA 23rd Ed.,2017,2540- D)
2.	Biochemical Oxygen Demand (BOD) (mg/l)	5.4	5.2	IS 3025(Part 44)1993Amd.01
3.	Sulphate as SO_4 (mg/l)	3031	3161	(APHA 23rd Ed.,2017,4500-SO4 E)
4.	Ammonical Nitrogen(µmol/l)	2.2	2.7	(APHA 23rd Ed.,2017,4500-NH3 B)
5.	Salinity (ppt)	38.5	38.7	By Calculation
6.	Dissolved Oxygen (mg/l)	5.8	5.6	IS 3025(Part 38)1989,
7.	Total Nitrogen (µmol/l)	7.6	6.9	(APHA 23rd Ed.,2017,4500-O,B),
8.	PO_4^3-P (µmol/l)	0.6	0.5	APHA 23rd Ed.,2017,4500 NH3 - B
9.	(NO_3-N)e (µmol/l)	0.9	0.4	(APHA 23rd Ed.,2017,4500-P,D)
10.	(NO_2-N)Nitrite (µmol/l)	0.5	0.7	(APHA 23rd Ed.,2017,4500 NO3-B)
11.	Phenol(µmol/l)	5.2	6.9	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

a) Temperature: Marine water temperature of the study area was checked on site, so surface & bottom water temperature observed in the study area in range between 29.0^{0}C to 30^{0}C. The water temperature generally varied in accordance with the prevailing air temperature, tidal activity and seasonal variation.

b) 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 in range of 7.91 to 8.08 at surface level and 7.90 to 8.03 at bottom level.

c) Salinity: Salinity which is an indicator of seawater, the standard average salinity of sea water is 37.9 to 39.5 ppt, which is variable depending on the riverine flow, any fresh water discharge from

landward side, rainy season and temperature in study area. Average salinity (ppt) for monsoon study is 37.9 to 39.5 ppt at surface water as well as 37.9 to 39.7 ppt at bottom water.

d) DO & BOD: High Dissolve oxygen level is measured of good oxidizing conditions in an aquatic environment. In unpolluted waters equilibrium is maintained between its generation through photosynthesis and dissolution from the atmosphere, and consumption by the respiration and decay of organic matter in a manner that Dissolve oxygen levels are close to or above saturation value.

Dissolve oxygen level of the study area is varied from 5.2 mg/l to 6.0 mg/l at water surface level & 5.1 mg/l to 5.8 mg/l at water bottom level. The comparison of average Dissolve oxygen value of monsoon period is 5.5 mg/l, which show the good oxidizing conditions in study area aquatic environment.

BOD was generally indicating effective consumption of oxidisable matter in that water body. BOD of the study area is varied from 4.7 mg/l to 5.4 mg/l at water surface level and 4.7 mg/l to 7.6 mg/l at water bottom level.

e) Nutrients: Dissolved phosphorus and nitrogen compounds serve as the nutrients for phytoplankton which is the primary producer in aquatic food chain. Phosphorous compounds are present predominantly as reactive phosphate while combined nitrogen is present as nitrate, nitrite and ammonium species. So nutrient concentration (phosphate -nitrate - nitrite) in the study area is Phosphate range 0.8 to 1.4 µmol/l in at Surface water and 0.9 to 1.2 µmol/l at Bottom water , Nitrate range 0.2 to 1.2 µmol/l in surface water and 0.3 to 0.9 µmol/l at bottom water, Nitrite range 0.4 to 0.5 µmol/l in surface level and 0.4 to 0.9µmol/l at bottom level, Sulphate range 2725 to 3125 mg/l in surface level and 2276 to 3161 mg/l at bottom level. This nutrient concentration values indicate water healthiness.

f) PHc and phenol: The observed Phenol in the study area in range of 4.5 to 11.5 µmol/l at surface level and 6.9 to 12.8 µmol/l at bottom level. The level of PHc in the study area is not detected .

g) Total suspended solids: The suspended solids generally constitute clay, silt and sand from the bed sediment and that from the upstream as well as contributed through shore erosion. Anthropogenic discharges also contribute to suspended solids in the form of contaminates such as oil and solid waste in polluted area. Suspended solids in the study area are little variable, surface area range observed 34 to 42mg/l as well as bottom area range is 31 to 46mg/l.

The Sediment quality at different stations are measured during this investigation is presented in Table No.4 and Table No.5

2.3 Inter tidal & Sub tidal Sediment analysis result:

Table 4 : Sub Tidal Sediment Analysis Result

No.	Parameters	SUBTIDAL SEDIMENT QUALITY(µgm/gm)					Test Method Permissible
		Station 1	Station 2	Station 3	Station 4	Station 5	
1.	Texture	Silty sand	sandy	sandy	Silty sand	Loamy sand	--
2.	Aluminium as Al%	1.4	1.7	1.2	1.5	1.6.	IS 3025(Part 55)2003
3.	Cobalt as Co(µg/g)	3	3	4	N.D.	7	AAS Method
4.	Copper as Cu(µg/g)	6	5	2	5	8	IS 3025(Part 42)1992amd.01,
5.	Zinc as Zn	31	29	36	42	28	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 22nd Ed.,2012,3112-B)
7.	Phosphorous (Total)(µg/g)	2.77	3.11	3.74	4.09	3.23	(APHA22nd Ed.,2012, 4500-P,D)
8.	C(Org.)%	1.8	1.5	1.7	1.8	1.2	Standard method (Walkley and Black, 1934).
9.	Chromium(µg/g)	5	7	11	6	8	IS 3025(Part 52)2003,
10.	Nickel(µg/g)	5	6	3	8	7	IS 3025(Part 54)2003,
11.	Manganese	9.23	8.77	8.11	9.41	7.14	APHA22nd Ed.,2012, 3500 Mn B
12.	Iron%	1.5	1.3	1.3	1.7	1.7	IS 3025(Part 53)2003,
13.	PHc(µg/g)	0.2	0.4.	0.7	0.8	1.1	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)	APHA22nd Ed.2012,3 114-C

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

Table 5 : Inter tidal Sediment Analysis Result

INTER TIDAL SEDIMENT QUALITY (µgm/gm)						
Sr. No	Parameters	Transect 1		Transect 2		Test Method Permissible
		High Tide	Low Tide	High Tide	Low Tide	
1.	Texture	Sandy	Sandy	Silty sand	Sandy	--
2.	Aluminum as Al%	1.3	2.6	1.4	2.0	IS 3025(Part 55)2003
3.	Cobalt as Co(µg/g)	8.23	9.84	8.27	8.58	AAS Method
4.	Copper as Cu(µg/g)	6.58	5.74	7.48	6.98	IS 3025(Part 42)1992amd.01,
5.	Zinc as Zn	30.25	34.68	28.65	33.21	IS 3025(Part 49)1994
6.	Mercury(µg/g)	ND	ND	ND	ND	(APHA 22nd Ed.,2012,3112-B)
7.	Phosphorous (Total)(µg/g)	2.65	3.02	2.49	2.38	(APHA 22nd Ed.,2012,4500-P,D)
8.	C(Org.)%	0.5	0.6	1.1	0.9	Standard method (Walkley and Black, 1934).
9.	Chromium(µg/g)	13.65	12.45	15.87	17.84	IS 3025(Part 52)2003,
10.	Nickel(µg/g)	22.31	20.59	18.47	15.98	IS 3025(Part 54)2003,
11.	Manganese	8.65	5.24	5.65	4.96	APHA 22nd Ed.,2012,3500 Mn B
12.	Iron%	1.9	3.2	2.9	1.8	IS 3025(Part 53)2003,
13.	PHc(µg/g)	0.7	0.5	0.6	0.4	G.C.Method
14.	Arsenic(µg/g)	N.D.	N.D.	N.D.	N.D.	APHA 22nd Ed.,2012,3114-C

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

Sr. No	Parameters	Transect 3		Test Method Permissible
		High Tide	Low Tide	
1.	Texture	Silty sand	Silty sand	--
2.	Aluminum as Al%	2.9	1.9	IS 3025(Part 55)2003
3.	Cobalt as Co(µg/g)	6.97	7.65	AAS Method
4.	Copper as Cu(µg/g)	4.31	4.12	IS 3025(Part42)1992amd.01,
5.	Zinc as Zn	35.22	30.26	IS 3025(Part 49)1994
6.	Mercury(µg/g)	ND	ND	(APHA 22nd Ed.,2012,3112-B)
7.	Phosphorous (Total)(µg/g)	3.89	2.31	(APHA 22nd Ed.,2012,4500-P,D)
8.	C(Org.)%	1.5	1.1	Standard method (Walkley and Black,1934).
9.	Chromium(µg/g)	13.25	12.35	IS 3025(Part 52)2003,
10.	Nickel(µg/g)	29.65	27.75	IS 3025(Part 54)2003,
11.	Manganese	8.35	6.74	APHA 22nd Ed.,2012,3500 Mn B
12.	Iron%	2.1	1.8	IS 3025(Part 53)2003,
13.	PHc(µg/g)	0.4	0.2	G.C.Method
14.	Arsenic(µg/g)	N.D.	N.D.	APHA 22nd Ed.,2012,3114-C

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

- The **texture** of sediment is sandy to Silty sand.
- The highest **phosphorus** content (4.09µgm/gm) was recorded at ST-4 and lowest phosphorous content (2.77 µgm/gm) was found at ST-2 in sub tidal region. In the Inter tidal region highest phosphorus content (3.89 µgm/gm) was recorded at IT-3(HWL) and lowest phosphorous content (2.31 µgm/gm) was found at IT-3(LWL)
- The **Chromium** content of marine sediment was ranged from 5µgm/gm to 11µgm/gm. The highest chromium content was recorded at ST-3 and lowest at ST-1. And In Intertidal region the highest chromium content (15.87 µgm/gm) was recorded at IT-2(HWL) and lowest chromium content (13.22 µgm/gm) was found at IT-2(LWL)
- The highest **Nickel** content (8.0 µgm/gm) was recorded at ST-4 and lowest Nickel content (3.0µgm/gm) was recorded at ST-3. In the Inter tidal region highest Nickel content (29.65µgm/gm) was recorded at IT-3(HWL) and lowest Nickel content (15.98µgm/gm) was found at IT-2(LWL).
- The highest **Copper** content (8.0 µgm/gm) was recorded at ST-5 and lowest copper content (2.0 µgm/gm) was recorded at ST-3.In the Inter tidal region highest copper content (7.48µgm/gm) was recorded at IT-2(HWL) and lowest copper content (4.12µgm/gm) was found at IT-3(LWL).
- The highest **Zinc** content (42 µgm/gm) was recorded at ST-4 and lowest zinc content (28 µgm/gm) was recorded at ST-5.In the Inter tidal region highest Zinc content (35.22 µgm/gm) was recorded at IT-3(HWL) and lowest Zinc content (28.65µgm/gm) was found at IT-2(HWL).
- The highest **Organic carbon** content (1.8 %) was recorded at ST-4 and lowest Iron content (1.2%) was recorded at ST-5. In the Inter tidal region highest Organic carbon content (1.5%) was recorded at IT-3(HWL) and lowest Iron content (0.5%) was found at IT-1(HWL).
- The highest **Iron** content (1.7 %) was recorded at ST-4 and lowest Iron content (1.3%) was recorded at ST-3. In the Inter tidal region, highest Iron content (3.2%) was recorded at IT-1(LWL) and lowest Iron content (1.8%) was found at IT-2(LWL).
- The highest **Manganese** content (9.41µgm/gm) was recorded at ST-4 and lowest Manganese content (7.14µgm/gm) was recorded at ST-5. In the Intertidal region highest Manganese content (8.65µgm/gm) was recorded at IT-1(HWL) and lowest Manganese content (4.96µgm/gm) was found at IT-2(LWL).
- The highest **Aluminum** content (1.7 %) was recorded at ST-2 and lowest Iron content (1.2%) was recorded at ST-3. In the Inter tidal region, highest Aluminum content (2.9%) was recorded at IT-3(HWL) and lowest Iron content (1.3%) was found at IT-1(HWL).

- The highest **Cobalt** content (7.0µgm/gm) was recorded at ST-4 and lowest Manganese content (3.0µgm/gm) was recorded at ST-1. In the Intertidal region highest Cobalt content (9.84µgm/gm) was recorded at IT-1(LWL) and lowest Manganese content (6.97µgm/gm) was found at IT-3(HWL).
- The highest **PHc** content (1.1µgm/gm) was recorded at ST-5 and lowest Manganese content (0.2µgm/gm) was recorded at ST-1. In the Intertidal region highest PHc content (0.7µgm/gm) was recorded at IT-1(HWL) and lowest Manganese content (0.2µgm/gm) was found at IT-3(LWL).
- Arsenic & Mercury was not detected in any station.

BIOLOGICAL CHARACTERISTICS (BIODIVERSITY STUDIES):

Marine environment is unique ecosystems involve the complex interaction between abiotic and biotic components. Any change in the abiotic factors leads to change in aquatic organisms (biotic factor). The human interventions always compromise the health of 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 APL the abundance and distribution of marine organisms (plankton and benthos) were studied as part of routine environmental monitoring.

3.1 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 broad functional groups:

1. Phytoplankton
2. Zooplankton

a) 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 is 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 is 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.

b) Zooplankton:

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

3.2 Significance of Phytoplankton and Zooplankton:

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 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 to the sea floor. A large number of phytoplankton species are grazed upon by the microscopic protozoan, tunicates, copepods and other crustaceans. These in turn become food for other animals further linking the food web. Therefore, variability in the reproduction of copepods would affect the survival of young fish that depend on them.

Table: 6 Test methods for Phytoplankton & Zooplankton analysis

Sr. no.	Test performed	Method
1	Phytoplankton	APHA, Edition 21, Part 10000, 10200 F
2	Zooplankton	APHA, Edition 21, Part 10000, 10200 G

3.3 Phytoplankton:

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 following table.7

Table 7: Phytoplankton Sampling Station

Station	Location	Co ordinates		Water depth	Tide
1	Intake point	22°48' 30.'50"N	69°32'57.84"E	6.5 m	Flood
2	Intake point Mouth area	22°47'07.20"N	69°32'06.50"E	7 m	Ebb - Flood
3	West port area	22°45'27.70"N	69°34'50.63"E	11 m	Flood - Ebb
4	Outfall area	22°44' 40.56"N	69°36'26.61"E	6 m	Flood
5	Outfall area	22°45'12.60"N	69°36'44.54"E	5.5 m	Flood - Ebb

Sample collection: A Niskin sampler with a closing mechanism at a desired depth was used for collecting sub surface water samples. Surface samples were collected using a clean polyethylene bucket. Samples were stored in amber colored plastic containers fitted with inert cap liners. Further Lugol's solution was added to preserve the phytoplankton cells for further enumeration. The identification of phytoplankton were carried out under a microscope using Sedgwick Rafter slide.

3.3.1 Microscopic Observations

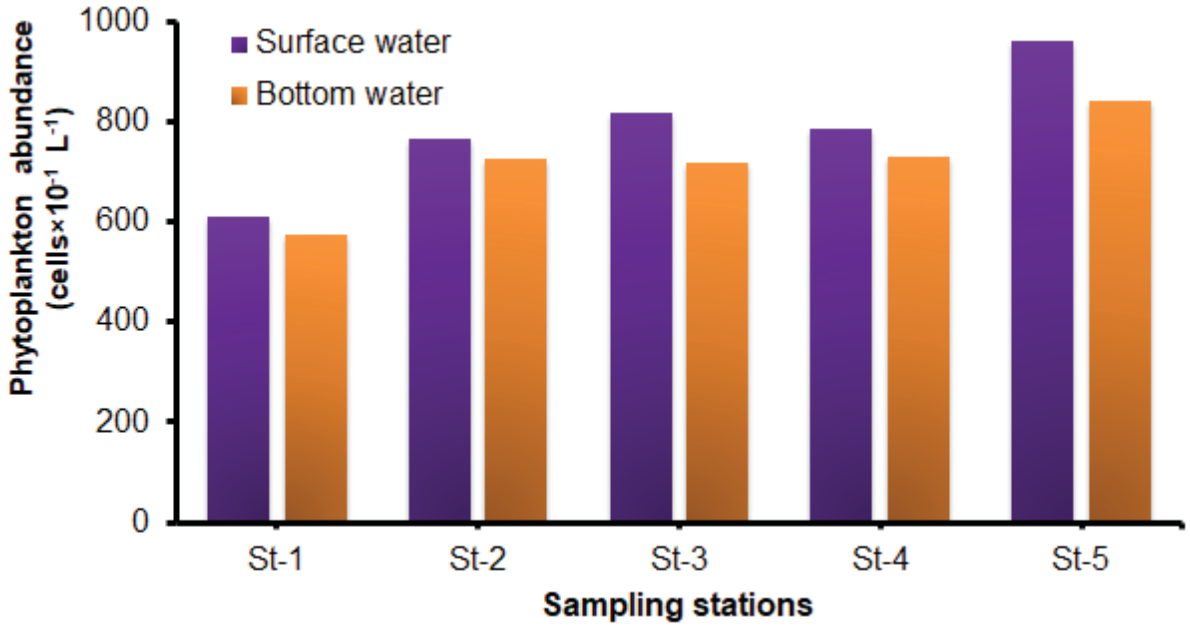
For phytoplankton enumeration 0.5 ml of the sample was taken on Sedgwick-Rafter counting cells. The identification was done using a microscope under 40X or 100X magnification. The standard keys given by Desikachary, 1959; Sournia, 1974; Tomas 1997; Horner, 2002 were used for the identification of phytoplankton cells. Species were identified to a genus level.

3.3.2 Phytoplankton Diversity

During the sampling period the diverse phytoplankton population in the coastal waters of APL, Mundra was represented with 44 phytoplankton genera. Out of which diatoms consisted of 34 genera and were represented of *Amphidinum*, *Amphora*, *Bacteriastrum*, Cerataulina, *Chaetoceros*, *Coretron*, *Coscinodiscus*, *Cylindrotheca*, *Diploneis*, *Ditylum, Fragilaria, Fragilariopsis*, *Gunardia, Haslea*, *Hemialus*, *Lauderia, Leptocylindrus, Mastogles*, *Melosera, Meuneria, Navicula, Nitzschia*, *Odontella, Pleurosigma, Pinnularia*, *Planktoniella, Pseudonitzschia*, *Rhizosolenia*, *Skeletonema*, *Surirella*, *Thalassionema*, *Thalassiosira*, *Thalassiothrix species* and some unidentified algal filaments (Table 3). The dinoflagellate community was represented by 8 genera consisted of species belonging to genera, *Ceratium, Dinophysis*, *Gonyaluax, Gymnodinium, Noctiluca, Prorocentrum, Scrippsiella* and some unidentified thecate dinoflagellate species. Overall, the phytoplankton community was mainly dominated by the genus *Coscinodiscus* (8%), *Thalassiosira* (4.5%), *Chaetoceros* (3.5%) and

Skeletonema (3.5%). The dinoflagellates were dominated by some unidentified thecate dinoflagellates (0.9%) and then with *Protoperidinium* (0.8%) and *Prorocentrum* (0.8%).

The overall phytoplankton abundance in the study region was ranged from 576 to 960 cells×10^{-1} L^{-1}. The highest phytoplankton abundance was observed at Station 5 in surface water (960 cells×10^{-1} L^{-1}) and bottom water (840 cells×10^{-1} L^{-1}). The lowest phytoplankton abundance (576 cells×10^{-1} L^{-1}) was observed at Station 1 bottom water (Table 3; Figure 1). The study shows that the marine waters around APL, Mundra supporting the phytoplankton population growth and diversity.

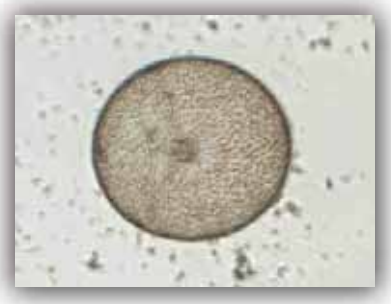


Graph 1.2: Abundance of phytoplankton (cells L^{-1}) observed in surface and bottom waters at the sampling stations.

Table 8: The phytoplankton abundance (cells×10-1 L-1) and species composition (%) at different sampling stations in the coastal waters of APL, Mundra during March 2021.
Note: S=surface; B=bottom; St=station

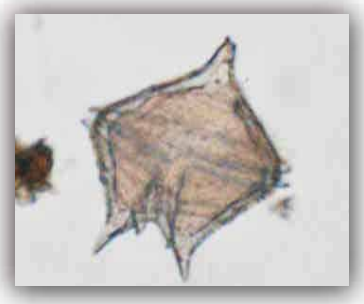
Phytoplankton genera	Sampling stations									
	St-1	St-1	St-2	St-2	St-3	St-3	St-4	St-4	St-5	St-5
	S	B	S	B	S	B	S	B	S	B
Diatoms										
Amphidinium	0	3	3	0	0	0	0	0	0	0
Amphora	9	6	3	3	3	6	0	6	12	6
Bacteriastrum	0	6	0	6	12	9	6	9	6	9
Bacillaria	3	0	6	0	0	3	0	6	0	6
Cerataulina	0	0	0	0	3	0	6	6	9	0
Chaetoceros	0	6	36	27	24	15	54	36	69	54
Corethron	0	0	0	0	0	6	0	0	9	3
Coscinodiscus	60	93	96	75	57	63	27	39	54	36
Cylindrotheca	0	0	6	12	0	6	3	6	3	0
Diploneis	0	3	0	6	0	3	0	3	0	0
Ditylum	9	6	6	9	24	12	24	12	27	18
Fragilaria	9	0	0	0	6	0	12	9	6	3
Fragilariopsis	0	0	0	0	0	0	0	6	0	0
Gunardia	0	0	0	3	12	0	3	0	18	12
Haslea	9	3	0	0	0	0	0	3	0	3
Hemialus	6	6	0	0	0	3	9	3	0	15
Lauderia	0	6	6	0	18	15	15	12	12	6
Leptocylindrus	6	0	0	3	9	0	6	12	0	6
Mastoglea	0	0	3	0	0	3	0	6	6	0
Melocera	6	15	24	6	3	0	6	0	0	0
Meuneria	0	0	0	0	0	6	3	0	3	9
Navicula	18	12	15	21	21	36	48	30	15	24
Nitzschia	0	3	6	6	24	18	30	45	42	51
Odontella	12	6	21	36	15	6	6	6	27	12
Pleurosigma	18	6	3	9	6	6	6	6	9	6
Pinnularia	3	0	0	0	0	6	9	0	3	0
Planktoniella	9	0	0	6	3	0	3	3	6	9
Pseudonitzschia	0	6	0	3	9	3	0	3	0	12
Rhizosolenia	0	9	0	0	9	6	6	0	12	9
Skeletonema	63	36	45	33	24	15	18	6	24	30
Surirella	0	0	0	0	9	3	0	0	6	3
Thalassionema	6	0	33	18	6	3	18	9	12	9
Thalassiosira	27	36	24	39	42	48	36	27	36	27
Thalassiothrix	0	0	0	0	18	9	6	3	12	9
Algal filaments	3	0	18	15	12	6	3	9	6	0
Dinoflagellates										
Ceratium	6	3	3	6	6	0	3	3	3	6
Dinophysis	3	6	6	3	0	3	0	3	0	0
Gonyaulax	0	0	0	6	6	9	3	3	3	6

Gymnodinium	3	0	0	0	3	0	3	0	0	0
Noctiluca	0	0	0	0	6	3	0	6	3	0
Prorocentrum	3	6	6	3	3	9	6	3	9	12
Protoperidinium	6	6	9	3	0	6	9	12	6	3
Scrippsiella	3	0	6	0	3	0	3	6	3	0
Unidentified dinoflagellates	6	0	0	6	12	15	3	9	9	6
Total phytoplankton (cells×10^{-1} L^{-1})	**612**	**576**	**768**	**726**	**816**	**720**	**786**	**732**	**960**	**840**



***Coscinodiscus* sp.**

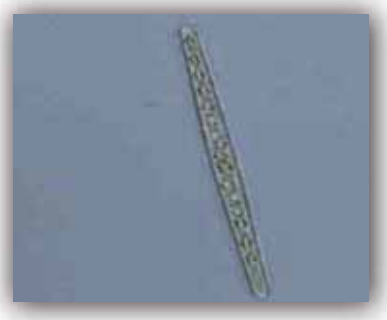
***Chaetoceros* sp.**



***Protoperidinium* sp.**

***Ceratium* sp.**

***Prorocentrum* sp.**



***Navicula* sp.**

***Nitzschia* sp.**

***Chaetocerous* sp.**

***Pleurosigma* sp.**

1.3: Phytoplankton diversity observed in surface and bottom waters at the sampling stations

3.4 Zooplankton:

Zooplankton samples were collected at 5 selected locations. The sampling details are given in following table 7.

Table 9: Zooplankton Sampling Station

Station	Location	Co ordinates		Water depth	Tide
1	Intake point	22°48' 30.'50"N	69°32'57.84"E	6.5 m	Flood
2	intake point	22°47'07.20"N	69°32'06.50"E	7 m	Ebb - Flood
3	West port area	22°45'27.70"N	69°34'50.63"E	11 m	Flood - Ebb
4	Outfall area	22°44' 40.56"N	69°36'26.61"E	6 m	Flood
5	Outfall area	22°45'12.60"N	69°36'44.54"E	5.5 m	Flood - Ebb

Sample collection: Oblique hauls for Zooplankton were made using Heron Tranter net with calibrated flow meter. Samples were preserved with formalin and stored in plastic containers with inert cap liners till further analysis.

3.4.1 Microscopic Observations

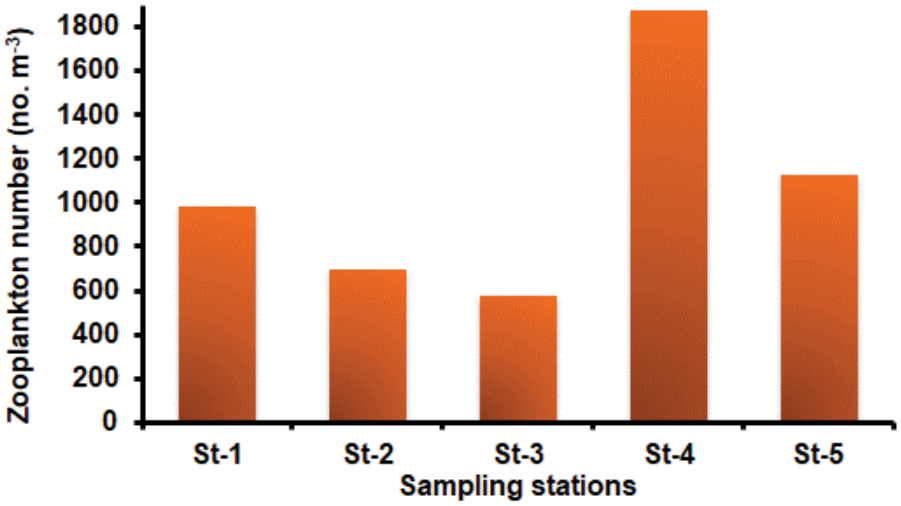
For quantification of zooplankton, 0.5 ml of the sample was taken in zooplankton counting chamber. The identification was carried out under Stereomicroscope at 45X or 100X magnification. The zooplanktons were identified using standard identification keys given by Kasturirangan 1963; Santhanam and Srinivasan, 1994 and Conway et al., 2003 etc. Species were identified to group level.

3.4.2 Zooplankton Diversity

Zooplankton standing stock in terms of abundance and species composition revealed substantial spatial variation within all 5 stations (Table 4). The maximum zooplankton abundance (1184 no. m^{-3}) and biomass (0.19 ml m^{-3}) were recorded at Station 4, whereas the minimum zooplankton abundance (563 no. m^{-3}) and biomass (0.12 ml m^{-3}) were observed at Station 2.

A total of 13 groups of zooplankton including Copepods, Copepod nauplii, Okiopleura, Decapoda (euphausids and shrimps), Fish and Decapode eggs, Crustacean larvae (brachyuran and anomuran crab larvae), Polychaete larvae, Gastropod larvae, Bivolve larvae, Rotifera, Foraminifera, Radiolaria, fish larvae were identified during this study (Table 4). Among these groups Copepods, Copepod nauplii were the most dominant and contributed 25 to 77% and 7 to 57% to the total zooplankton abundance respectively. Decapoda was another dominant group that contributes 2 to 10% to the

zooplankton population in this region. Bivalve, gastropod, polychaete larvae as well as eggs of shrimps and fishes are another major group reported in the study area. The occurrence of copepods and their nauplii together with crustacean larvae, decapods and fish larvae/eggs in zooplankton samples highlights the fair production potential of live food resources (organisms) to support the fish and shellfish population in the study region.



Graph 1.4: Zooplankton density (nos./ m^3) in the sampling area (station 1 to 5) in marine environment of APMuL, Mundra

Table 10: Density (no. m-3), percentage contribution (%) and biomass (ml. m-3) of various zooplankton groups in the coastal waters at the APL, Mundra during March 2021
Note: The values in the bracket indicates the percentage contribution of a particular group.

Zooplankton groups	Sampling stations				
	St-1	St-2	St-3	St-4	St-5
Copepoda	459 (70%)	351 (62%)	267 (42%)	917 (77%)	264 (25%)
Copepod nauplii	185 (25%)	90 (16%)	240 (37%)	78 (7%)	609 (59%)
Oikopleura	0	0	7 (1%)	0	30 (3%)
Decapoda	73 (10%)	53 (9%)	44 (7%)	57 (5%)	18 (2%)
Fish and Decapode egg	0	8 (1%)	4 (1%)	18 (2%)	18 (2%)
Crustacean larvae	0	11 (2%)	16 (2%)	0	36 (3%)
Polychaete larvae	11 (1%)	2 (0.3%)	22 (3%)	78 (7%)	13 (1%)
Gastrapod larvae	0	8 (1%)	2 (0.4%)	18 (2%)	17 (2%)
Bivolve larvae	13 (2%)	15 (3%)	25 (4%)	7 (1%)	36 (3%)
Rotifera	0	4 (1%)	1 (0.2%)	0	0
Foraminifera	2 (0.3%)	0	0	4 (0.3%)	0
Radiolaria	2 (0.3%)	0	2 (0.4%)	0	0

Fish larvae	0	23 (4%)	10 (2%)	7 (1%)	1 (0.1%)
Total abundance (no m^{-3})	**741**	**563**	**640**	**1184**	**1040**
Biomass (ml. m^{-3})	**0.14**	**0.12**	**0.12**	**0.19**	**0.18**
Total groups	**7**	**10**	**12**	**9**	**10**

Copepod sp.

Copepod sp.

Copepod nauplii

Decapod larvae

Radiolarian

Oikopleura

1.5 Microphotographs of zooplanktons reported at sampling stations

3.5 Benthic Fauna

The benthic zone is the ecological region at the lowest level of a 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 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 other microhabitat at the bottom.

The benthic invertebrates ranges from microscopic (e.g. micro invertebrates, <10 microns) to a few tens of centimeters or more in length (e.g. macro invertebrates, >50 cm).

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 as 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 depends 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 in are scavengers or detritivores. These organisms by virtue of being relatively stationary, are constantly exposed to changes undergoing in overlying water, and hence, respond very well to aquatic pollution. The macro benthic population is very sensitive to environmental perturbation and is highly influenced by the physicochemical characteristics of water, nature of substratum, food, predation and other factors. The density of benthic invertebrates also fluctuates widely with the changes in the season.

3.5.1 Significance of benthic macro invertebrates

The biomass of benthic 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) helps to mix the sediment and enhances 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 macro invertebrates. Loss of nitrification and denitrification (and increased ammonium efflux from sediment) in coastal and estuarine systems is an important cause of hysteresis, which can cause a shift from clear water to a turbid state.

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 are 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.

3.5.2 Methodology

To enumerate the macro-benthic population sediment samples were collected from 5 sub-tidal and 3 inter-tidal transects. The details are as mentioned in the table (12 & 13). Sample was collected in the month of March 2021.

Table 11: Test method for Benthos analysis

Sr. No	Test performed	Method
1	Benthos	APHA, Edition 21, Part 10000,10500 A-10500 D

Table 12: Sub-tidal Benthos Sampling Sites

Station	Location	Co ordinates		Sediment quality
1	Intake point	22°48' 30.'50"N	69°32'57.84"E	Clayey
2	intake point	22°47'07.20"N	69°32'06.50"E	Silty clay
3	West port area	22°45'27.70"N	69°34'50.63"E	Silty clay
4	Outfall area	22°44' 40.56"N	69°36'26.61"E	Sandy
5	Outfall area	22°45'12.60"N	69°36'44.54"E	Silty clay

Table 13: Inter-tidal Benthos Sampling Sites

Transect	Location	Co ordinates	Intertidal expose area (m)	Sediment quality
I	High water level	22°47'07.55" N	40 m	Sandy
	Low water level	22°47'06.38"N		Silty-sand
II	High water level	22°45'58.72" N	56 m	Sandy
	Low water level	22°45'57.74" N		Silty-sand
III	High water level	22°44' 52.21" N	45 m	Sandy
	Low water level	22°44' 51.23" N		Sandy

Sample collection: For the analysis of Benthos subtidal sediment samples were collected using Van-veen grab as well as intertidal samples were collected using metal quadrant.
The total Macro benthos population (sub tidal & intertidal) was estimated as number of 1 m^2 area and biomass on wet weight basis.

3.5.3 Handling and Preservation

The samples were first sieved with 500 µ size metal sieve and then washed with sea water. Sieving yields residual mixture of benthic organisms and detritus matter. The organisms were handpicked using forceps and paint brush. After sorting, macro benthic organisms were identified to the group level. Organisms were preserved in 10% formalin.

3.5.4 Identification

Identification of the organisms was done under stereo-microscope. Day, 1967, Fauchald, 1977 were used as standard reference for identification of the macro invertebrates.

3.5.5 Benthic Diversity

The sediment texture at the sampling stations ranged from sandy-silty to clayey sediment, which directly affects the distribution of the benthic organisms in this region. The fluctuation in tidal level and exposer time also influence 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 APL, Mundra (Table 8). The macrobenthos density in the subtidal region at the APL marine monitoring area was ranged from 450 no. m^{-2} to 900 no. m^{-2} (Table 8; Figure 3). Similarly, the biomass of the macrobenthic community in the subtidal region was ranged from 0.53 g. m^{-2} to 6.57 g. m^{-2}. The maximum density and biomass of benthic macro-organisms were reported at Station 1 (900 no. m^{-2} and 6.57 g. m^{-2} respectively). Similarly, the least minimum density (450 no. m^{-2}) and biomass (0.53 g. m^{-2}) were observed at station 4. In species composition, Polychaete species (Phylum Annelida) belonging to family *Paraonidae*, *Orbiniidae*, *Cossuridae*, *Eunicidae*, *Nereidae*, *Capitellidae*, *Spionidae*, *Sabellidae*, *Syllidae*, *Nephtyidae* contributed (66.9%) to the total macrobenthic abundance in this region. More occurrence of this group could indicate the organic carbon enrichment in the sediment. Overall, the presence of Polychaete, Sipuncula worms and amphipods suggest the availability of food organisms for benthic predators in the area.

Table 14: Faunal composition, density (no. m-2) and biomass (g. m-2) of the macrobenthos community in the subtidal region at APL, Mundra during March 2021

Faunal groups	Subtidal stations				
	St-1	St-2	St-3	St-4	St-5
Phylum Annelida					
Paraonidae	800	300	25	50	0
Orbiniidae	25	0	0	0	0
Cossuridae	25	0	0	0	0
Eunicidae	0	25	0	0	0
Nereidae	0	75	25	0	0
Capitellidae	0	0	50	0	0
Spionidae	0	0	0	25	0
Sabellidae	0	0	0	25	0
Syllidae	0	0	0	50	0

Nephtyidae	0	0	0	0	175
Phylum Protozoa					
Foraminifera	0	0	25	0	0
Phylum Mollusca					
Bivalve	25	0	0	25	0
Phylum Arthropoda					
Amphipoda	25	0	150	0	0
Isopoda	0	0	0	0	25
Phylum Sipuncula					
Sipunculids	25	0	150	0	25
Total density (no. m^{-2})	**925**	**400**	**425**	**175**	**225**
Biomass (g. m^{-2})	**7.07**	**2.28**	**1.28**	**0.53**	**0.78**

Sub tidal region:

The sediment texture in sub-tidal stations (Station1 to Station 5) was comprised of Sandyand Clayey.

Intertidal region:

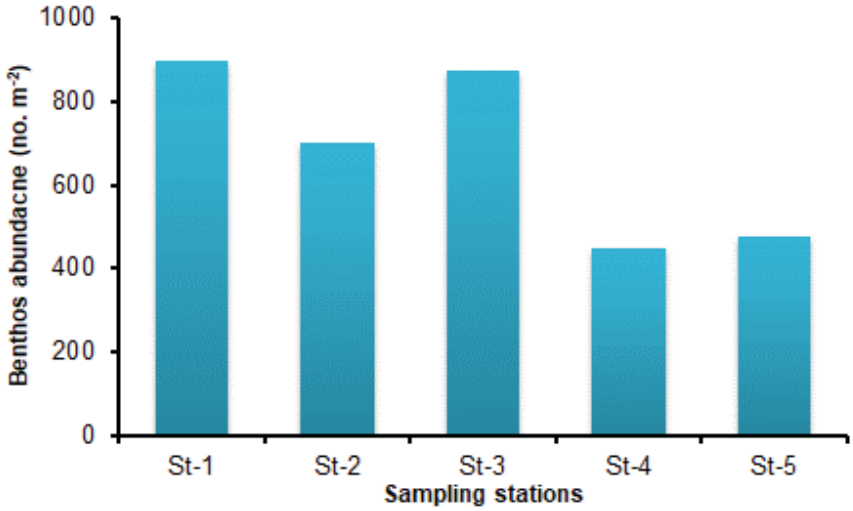
The macrobenthos biomass in the intertidal region was measured from 0.03 g m^{-2} to 0.40 g m^{-2} (Table 9). The lower density of macrobenthic organisms was reported at station IT-2 (HW) (75 no. m^{-2}), whereas, the highest density was reported at Station IT-1 (LW) (225 nos. m^{-2}). Polychaete (belonging to Phylum Annelida) species contributed (54.5%) to the total macrobenthic abundance at these stations followed by Amphipoda (27%).

Table 15: Faunal composition, density (nos. m^{-2}) of macrobenthos from the sediments collected at High Tide Levels (HTL) and Low Tide Levels (LTL) in inter-tidal region at APMUL, Mundra during March 2021

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

Faunal groups	**Intertidal stations**					
	IT-1 (HW)	**IT-1 (LW)**	**IT-2 (HW)**	**IT-2 (LW)**	**IT-3 (HW)**	**IT-3 (LW)**
Phylum Annelida						
Paraonidae	50	75	25	0	0	0
Cossuridae	0	0	25	0	0	0
Eunicidae	25	0	0	25	0	0
Nereidae	0	0	0	25	0	0
Capitellidae	0	50	0	0	0	0
Syllidae	0	0	0	0	0	0
Phylum Mollusca						
Bivalve	0	25	0	0	0	0
Phylum Arthropoda						
Amphipoda	50	50	25	25	0	0
Isopoda	0	25	0	25	0	0

Phylum Sipuncula						
Sipunculids	0	0	0	25	0	0
Total density (no. m^{-2})	**125**	**225**	**75**	**125**	**0**	**0**
Biomass (g. m^3)	**0.40**	**0.20**	**0.11**	**0.03**	**0**	**0**



Graph 1.6: Sub-tidal macro benthos at different sampling stations in APMuL, Mundra marine monitoring area during March 2021

Cossura sp.

Spinculate sp.

Prionospio sp.

Spionidae

Nereis sp.

Amphipod

1.7 Microphotographs of macro benthic organisms

3.6 Phytoplankton pigments (Chlorophyll and Pheophytin)

Chlorophyll and Pheophytin concentration:

Marine phytoplankton contains the essential as well as accessory pigment similar as 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 transfer to higher tropic level in the food web through 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 colored degradation products of these pigments. The nature of these degradation products depends on which part of the chlorophyll molecule that is affected. As chlorophyll degrades, the initial step is either the loss of the magnesium from the center of the molecule or the loss of the phytol tail. This results in the formation of the molecule, *phaeophytin*. Depending on the parent molecule a number of distinct molecules like phaeophytins, chlorophyllides, and pheophorbides can be produced. Thus in addition to Chlorophyll *a* filtered sea water contains colored degradation products of phytoplankton pigments.

Figure 1.8: The Degradation Pathways of Chlorophyll

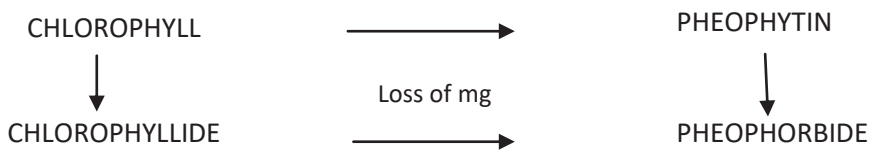


Table 16: Method of analysis for Chlorophyll a and Pheophytin

Sr. no	Test performed	Method
1	Chlorophyll *a* and Pheophytin	APHA, Edition 21, Part 10000, 10200 H (with some modification)

3.6.1 Estimation of Chlorophyll *a* and Pheophytin:

- Sampling locations were same as that of the plankton samples. Surface water samples were collected in clean plastic dark bottles.
- Water samples were filtered through Whattman glass microfiber filters (GF/F: 47 mm) and paper was macerated in 90% acetone and one night stored in the dark at 4ºC.
- The extraction slurry was transferred to 15 ml centrifugation tube and centrifuged at ~2000 rpm for 10 min.
- The extract was decanted into a 15 ml centrifuge tube, volume was adjusted to 10 ml with 90% acetone.
- Clarified extract was transferred to cuvette. Chlorophyll florescence was measured using Turner Flurometer.
- The extract was then acidified in the cuvette with 0.1 ml of 0.1 N NH_4Cl. The acidified extract is gently agitated and phaeophytin florescence was measured using Turner Flurometer (after acidification).

3.6.2 Chlorophyll *a* and phaeophytin concentrations

The phytoplankton biomass distribution expressed in terms of Chlorophyll *a* (Chl*a*) and phaeophytin at selected stations in the coastal region of APL, Mundra is presented in Table 10. The Chl*a* concentrations in the study region were ranged from 0.79 to 1.27 µg. L^{-1}. The phaeophytin content was ranged from 0.61 to 1.01 µg. L^{-1}. The Chl*a* and phaeophytin concentrations were more in the surface water as compared to the bottom water. The small variations observed between the surface and bottom waters could be due to the natural biological variability inherent to such dynamic ecosystems. The highest Chl*a* concentration was observed at Station 5 surface water, whereas the highest Phaeophytin concentration observed at Station 2 bottom water.

The concentration of phaeophytin 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 phaeophytin in an aquatic ecosystem suggests a balance between the growth and mortality of phytoplankton life. In healthy environments, ratios of Chl*a* to phaeophytin generally exceed 1.2. In the present study, this ratio was ranged from 0.96 to 1.81 (Table 11). The Chl*a* and Phaeophytin ratio showed marginally elevated levels in the surface waters as compared to the bottom waters. Overall, the ratios of Chl*a* and phaeophytin concentration in the study region were generally high (>1) except station 1 in the bottom water, indicating that the appropriate conditions prevailed for the phytoplankton growth.

Table 17: Chlorophylla, Phaeophytin concentrations along with their ratios (Chla: Phaeophytin) in the marine waters of APL, Mundra during March 2021.

Sampling stations		Chlorophyll a ($\mu g. L^{-1}$)	Phaeophytin ($\mu g. L^{-1}$)	Chl*a*: Phaeophytin ratio
St-1	Surface	0.79	0.62	1.27
St-1	Bottom	0.94	0.99	0.96
St-2	Surface	1.05	0.83	1.27
St-2	Bottom	0.96	0.88	1.09
St-3	Surface	1.15	0.76	1.50
St-3	Bottom	0.99	0.82	1.21
St-4	Surface	1.14	0.63	1.81
St-4	Bottom	1.04	0.61	1.71
St-5	Surface	1.27	0.84	1.52
St-5	Bottom	1.14	1.01	1.12

3.7 Conclusion

Overall assessment reveals that the physicochemical and biological parameters of the present sampling data did not deviate from the baseline monitoring data. The diverse phytoplankton and zooplankton population indicates the favourable water condition for their survival and growth. This diverse planktonic flora and together with enriched subtidal benthic fauna could substantially support the fishery population in the region. However, the unstable benthic sediment as the effect of natural (tidal currents, circulations) and anthropogenic activity (dredging, ship movement) activity could affect the settlement of the benthic fauna, especially in the west port and outfall area.

Table 20: Names of the Marine Monitoring Team Members

Sr. No.	Name of Person
1.	Dr. Dhiraj Narale (Marine Scientist)
2.	Mr. Vijay Thanki (Env. Chemist)
3.	Mr. Pravin Singh (Env. Chemist)
4.	Miss. Shweta A. Rana (Env. Microbiologist)
5.	Dr. Shivanagouda Sanagoudra (Marine Biologist)

DIFFERENT TYPES OF SAMPLING PHOTOGRAPHS

****

adani	**Adani Power (Mundra) Limited, Mundra**
	Summary of Continues Ambient Air Quality Monitoring System Reports (Oct'2020 TO Mar'2021)

		Station: ECO Park					**Station: Near Main Gate**					**Station: Near Ash Pond**			
Parameters		**PM10**	**PM2.5**	**SO_2**	**NO_2**	**O_3**	**PM10**	**PM2.5**	**SO_2**	**NO_2**	**O_3**	**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**	**ug/m^3**	**ug/m^3**
MONTH	**GPCB LIMIT**	**100**	**60**	**80**	**80**	**100**	**100**	**60**	**80**	**80**	**100**	**100**	**60**	**80**	**80**
April'20	Minimum	53.8	23.2	18.8	17.8	19.6	48.8	22.4	15.8	14.9	21.5	59.2	32.4	15.4	19.8
	Maximum	81.5	36.3	30.8	27.9	52.5	80.5	33.3	29.8	24.9	49.5	75.2	39.1	23.6	24.6
	Average	69.9	30.4	26.6	23.5	39.7	66.9	27.7	23.8	21.0	37.5	66.2	36.0	18.7	21.7
May'20	Minimum	57.4	26.4	21.8	14.9	22.7	53.8	25.4	21.8	17.8	18.5	57.4	31.7	15.5	19.6
	Maximum	80.8	40.1	33.8	25.9	54.5	82.5	36.4	35.8	27.8	47.5	72.1	37.7	21.7	24.3
	Average	69.5	33.3	29.4	21.1	42.1	69.2	30.8	29.7	23.2	34.8	65.0	34.6	18.2	22.3
June'20	Minimum	60.8	27.9	21.8	21.8	27.7	45.8	28.1	26.3	18.6	30.5	69.2	25.8	15.2	19.2
	Maximum	88.5	40.2	33.8	31.9	60.5	77.5	39.4	38.1	28.9	58.5	85.4	36.2	21.3	23.8
	Average	76.8	34.5	29.6	27.5	47.7	63.9	33.7	32.8	25.0	46.5	77.9	32.8	17.8	21.4
July' 20	Minimum	59.3	23.4	14.5	19.3	31.6	48.6	22.6	18.1	16.1	35.1	55.4	29.6	16.1	19.6
	Maximum	84.4	36.7	25.9	30.2	63.0	83.5	35.5	30.0	27.2	63.2	71.2	36.3	20.5	23.1
	Average	74.7	31.6	22.1	25.0	50.9	66.2	30.1	25.1	22.7	50.7	62.3	32.5	18.1	21.4
August' 20	Minimum	61.8	19.5	16.0	14.3	29.2	51.1	21.1	19.6	13.5	35.2	52.3	26.9	16.9	19.9
	Maximum	85.5	34.2	27.8	25.2	73.2	84.6	33.7	29.5	21.3	60.5	66.2	37.2	21.2	24.5
	Average	76.3	28.1	23.5	20.1	39.6	66.6	28.1	25.8	17.6	45.6	59.7	32.5	18.7	21.9
September'20	Minimum	64.8	23.0	20.6	18.0	41.8	56.0	24.9	22.4	17.3	23.8	53.2	27.7	16.7	20.4
	Maximum	84.3	37.2	33.3	28.6	61.3	85.3	37.2	33.3	30.6	43.3	71.2	36.5	21.5	25.2
	Average	77.7	31.8	29.0	23.8	54.4	72.2	31.7	29.2	21.7	36.4	61.3	33.0	18.8	23.1

adani	Adani Power (Mundra) Limited, Mundra
	Differential Water Temperature Report (Oct'20 to Mar'21)

Annexure – V

Month: October'2020			
Date	**Intake Reservoir (ºC)**	**Outfall channel (ºC)**	**Temp. difference (ºC)**
01-10-2020	29.0	33.0	4.0
02-10-2020	28.5	33.0	4.5
03-10-2020	29.0	33.5	4.5
04-10-2020	29.5	34.0	4.5
05-10-2020	30.0	34.0	4.0
06-10-2020	31.0	35.0	4.0
07-10-2020	30.5	34.0	3.5
08-10-2020	30.0	34.5	4.5
09-10-2020	30.5	34.5	4.0
10-10-2020	29.5	34.0	4.5
11-10-2020	30.5	35.0	4.5
12-10-2020	29.5	34.0	4.5
13-10-2020	30.0	34.5	4.5
14-10-2020	30.5	34.0	3.5
15-10-2020	30.0	35.0	5.0
16-10-2020	29.5	33.0	3.5
17-10-2020	30.0	33.5	3.5
18-10-2020	30.5	33.5	3.0
19-10-2020	29.5	33.0	3.5
20-10-2020	30.0	34.0	4.0
21-10-2020	30.5	34.0	3.5
22-10-2020	30.0	33.5	3.5
23-10-2020	30.5	34.0	3.5
24-10-2020	29.0	33.5	4.5
25-10-2020	29.5	32.5	3.0
26-10-2020	30.0	33.0	3.0
27-10-2020	29.5	33.5	4.0
28-10-2020	31.0	33.5	2.5
29-10-2020	29.5	33.0	3.5
30-10-2020	30.0	33.0	3.0
31-10-2020	29.5	32.5	3.0
Min.	**28.5**	**32.5**	**2.5**
Max.	**31.0**	**35.0**	**5.0**
Average	**29.9**	**33.8**	**3.9**

adani	Adani Power (Mundra) Limited, Mundra
	Differential Water Temperature Report (Oct'20 to Mar'21)

Annexure – V

Month: November'2020			
Date	**Intake Reservoir (ºC)**	**Outfall channel (ºC)**	**Temp. difference (ºC)**
01-11-2020	28.0	30.5	2.5
02-11-2020	28.0	30.5	2.5
03-11-2020	28.0	31.0	3.0
04-11-2020	28.5	31.5	3.0
05-11-2020	28.5	31.5	3.0
06-11-2020	28.5	32.0	3.5
07-11-2020	28.5	31.5	3.0
08-11-2020	28.0	31.5	3.5
09-11-2020	28.5	31.5	3.0
10-11-2020	27.5	31.5	4.0
11-11-2020	27.5	30.5	3.0
12-11-2020	28.0	31.5	3.5
13-11-2020	27.0	30.5	3.5
14-11-2020	27.0	30.5	3.5
15-11-2020	27.5	31.0	3.5
16-11-2020	27.5	30.5	3.0
17-11-2020	27.5	31.0	3.5
18-11-2020	27.5	31.0	3.5
19-11-2020	26.5	30.0	3.5
20-11-2020	27.0	30.5	3.5
21-11-2020	26.5	30.5	4.0
22-11-2020	27.0	31.0	4.0
23-11-2020	27.0	31.0	4.0
24-11-2020	27.0	30.5	3.5
25-11-2020	26.5	30.0	3.5
26-11-2020	26.0	30.0	4.0
27-11-2020	26.5	30.5	4.0
28-11-2020	25.5	29.5	4.0
29-11-2020	26.5	30.5	4.0
30-11-2020	26.0	29.5	3.5
Min.	25.5	29.5	2.5
Max.	**28.5**	**32.0**	**4.0**
Average	**27.3**	**30.8**	**3.5**

adani	Adani Power (Mundra) Limited, Mundra
	Differential Water Temperature Report (Oct'20 to Mar'21)

Annexure – V

Month: December'2020			
Date	**Intake Reservoir (ºC)**	**Outfall channel (ºC)**	**Temp. difference (ºC)**
01-12-2020	24.5	27.5	3.0
02-12-2020	23.5	27.0	3.5
03-12-2020	23.0	25.5	2.5
04-12-2020	22.5	26.0	3.5
05-12-2020	23.0	26.0	3.0
06-12-2020	24.0	27.0	3.0
07-12-2020	24.0	26.0	2.0
08-12-2020	23.0	26.5	3.5
09-12-2020	23.5	26.5	3.0
10-12-2020	22.5	26.0	3.5
11-12-2020	23.5	27.0	3.5
12-12-2020	22.5	26.0	3.5
13-12-2020	23.0	26.5	3.5
14-12-2020	23.5	26.0	2.5
15-12-2020	23.0	25.5	2.5
16-12-2020	22.5	25.0	2.5
17-12-2020	23.0	25.5	2.5
18-12-2020	23.5	25.5	2.0
19-12-2020	22.5	25.5	3.0
20-12-2020	20.0	24.0	4.0
21-12-2020	20.5	24.0	3.5
22-12-2020	21.0	24.5	3.5
23-12-2020	21.5	24.5	3.0
24-12-2020	19.5	23.5	4.0
25-12-2020	19.5	23.0	3.5
26-12-2020	20.0	23.0	3.0
27-12-2020	19.5	23.5	4.0
28-12-2020	18.5	22.5	4.0
29-12-2020	19.5	23.0	3.5
30-12-2020	19.0	23.5	4.5
31-12-2020	19.5	23.0	3.5
Min.	**18.5**	**22.5**	**2.0**
Max.	**24.5**	**27.5**	**4.5**
Average	**22.0**	**25.2**	**3.2**

adani	**Adani Power (Mundra) Limited, Mundra**
	Differential Water Temperature Report (Oct'20 to Mar'21)

Annexure – V

Month: January'2021			
Date	**Intake Reservoir (ºC)**	**Outfall channel (ºC)**	**Temp. difference (ºC)**
01-01-2021	21.5	24.5	3.0
02-01-2021	20.5	23.5	3.0
03-01-2021	20.0	23.0	3.0
04-01-2021	19.5	23.0	3.5
05-01-2021	20.0	24.0	4.0
06-01-2021	21.0	24.0	3.0
07-01-2021	21.0	24.0	3.0
08-01-2021	20.5	24.5	4.0
09-01-2021	20.5	24.5	4.0
10-01-2021	19.5	23.5	4.0
11-01-2021	20.5	24.5	4.0
12-01-2021	20.0	24.0	4.0
13-01-2021	20.0	23.5	3.5
14-01-2021	20.5	24.0	3.5
15-01-2021	20.0	23.5	3.5
16-01-2021	20.5	24.5	4.0
17-01-2021	21.0	24.0	3.0
18-01-2021	21.5	24.5	3.0
19-01-2021	20.5	24.0	3.5
20-01-2021	20.5	24.0	3.5
21-01-2021	21.0	24.0	3.0
22-01-2021	21.0	24.5	3.5
23-01-2021	21.5	24.5	3.0
24-01-2021	20.5	24.5	4.0
25-01-2021	21.2	24.0	2.8
26-01-2021	21.0	23.5	2.5
27-01-2021	20.5	23.5	3.0
28-01-2021	21.0	24.0	3.0
29-01-2021	21.5	24.0	2.5
30-01-2021	21.0	24.5	3.5
31-01-2021	21.5	24.5	3.0
Min.	**19.5**	**23.0**	**2.5**
Max.	**21.5**	**24.5**	**4.0**
Average	**29.1**	**32.6**	**3.4**

adani	Adani Power (Mundra) Limited, Mundra
	Differential Water Temperature Report (Oct'20 to Mar'21)

Annexure – V

Month: February'2021			
Date	**Intake Reservoir (ºC)**	**Outfall channel (ºC)**	**Temp. difference (ºC)**
01-02-2021	23.0	26.0	3.0
02-02-2021	22.0	25.0	3.0
03-02-2021	22.5	25.5	3.0
04-02-2021	22.5	26.0	3.5
05-02-2021	23.0	26.0	3.0
06-02-2021	23.5	26.5	3.0
07-02-2021	24.0	26.5	2.5
08-02-2021	23.5	26.0	2.5
09-02-2021	23.5	26.0	2.5
10-02-2021	23.0	26.5	3.5
11-02-2021	23.5	26.0	2.5
12-02-2021	23.5	26.0	2.5
13-02-2021	24.0	26.5	2.5
14-02-2021	23.5	27.0	3.5
15-02-2021	23.0	26.5	3.5
16-02-2021	23.5	27.0	3.5
17-02-2021	24.0	27.0	3.0
18-02-2021	24.5	27.5	3.0
19-02-2021	23.5	27.0	3.5
20-02-2021	23.5	27.0	3.5
21-02-2021	24.5	27.5	3.0
22-02-2021	24.5	27.0	2.5
23-02-2021	24.0	27.0	3.0
24-02-2021	23.5	27.5	4.0
25-02-2021	24.0	26.8	2.8
26-02-2021	24.0	26.5	2.5
27-02-2021	24.5	27.0	2.5
28-02-2021	23.5	26.5	3.0
Min.	**22.0**	**25.0**	**2.5**
Max.	**24.5**	**27.5**	**4.0**
Average	**23.6**	**26.5**	**3.0**

adani	Adani Power (Mundra) Limited, Mundra
	Differential Water Temperature Report (Oct'20 to Mar'21)

Annexure – V

Month: March'2021			
Date	**Intake Reservoir (ºC)**	**Outfall channel (ºC)**	**Temp. difference (ºC)**
01-03-2021	25.0	28.5	3.5
02-03-2021	24.5	28.0	3.5
03-03-2021	26.0	29.0	3.0
04-03-2021	26.0	29.5	3.5
05-03-2021	26.5	30.0	3.5
06-03-2021	27.0	30.5	3.5
07-03-2021	26.5	30.0	3.5
08-03-2021	26.5	30.5	4.0
09-03-2021	26.5	29.0	2.5
10-03-2021	26.0	29.5	3.5
11-03-2021	25.5	29.0	3.5
12-03-2021	25.5	29.0	3.5
13-03-2021	26.0	29.0	3.0
14-03-2021	26.0	29.5	3.5
15-03-2021	25.5	29.0	3.5
16-03-2021	26.0	29.5	3.5
17-03-2021	26.5	29.5	3.0
18-03-2021	27.0	30.0	3.0
19-03-2021	26.0	29.5	3.5
20-03-2021	26.0	29.5	3.5
21-03-2021	25.5	29.5	4.0
22-03-2021	27.0	30.5	3.5
23-03-2021	27.5	30.5	3.0
24-03-2021	27.0	31.0	4.0
25-03-2021	27.0	30.5	3.5
26-03-2021	27.5	31.0	3.5
27-03-2021	27.0	29.5	2.5
28-03-2021	26.5	29.5	3.0
29-03-2021	27.0	30.0	3.0
30-03-2021	27.0	30.5	3.5
31-03-2021	27.5	31.0	3.5
Min.	**24.5**	**28.0**	**2.5**
Max.	**27.5**	**31.0**	**4.0**
Average	**26.3**	**29.6**	**3.4**

adani	Adani Power (Mundra) Limited, Mundra
	Greenbelt Details

Annexure: VI

Greenbelt Details:

Area (ha)	No. of Trees & Palm Planted	No. of Shrubs Planted
139.46	261337	1400954

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 Power (Mundra) Limited

Annex VII

ASH PERCENTAGE IN COAL

(From October' 2020 to December' 2020)

Sl. No.	Month	Coal Consumption (MT)	Ash Content in Coal (%)	Quarterly Average (%)
1	October 2020	1,715,048	4.64	
2	November 2020	1,548,641	4.41	**4.71 %**
3	December 2020	1,498,820	5.07	

ADANI POWER (MUNDRA) LIMITED

ASH PERCENTAGE IN COAL

(From January'2021 to March'2021)

Month	Coal Consumption (MT)	Ash Content in Coal (in %)
January- 2021	1173,896	5.47
February- 2021	853,771	5.37
March-2021	999,516	4.82
Quarterly Average (%)	**----**	**5.22**

MT: Metric Tone

adani	Adani Power (Mundra) Limited, Mundra
	Ash Production & Disposal (October 2020 to March 2021)

Annexure – VIII

Month	Ash Production (MT/month)	For Cement manufacturing (MT/Month)	For Brick / Construction / Traders (MT/ month)	Reclamation of Low-Lying Areas (MT/month)	Ash Dyke (MT/ month)	Bottom Ash (Sold/ Export) MT/month	Dyke Ash lifted for reutilization (MT)	Total Ash Utilized (Silo + Dyke) (MT)	% of Ash Utilization	Previous Month's Stock (MT)
										2226
Oct-20	79583	48806	10914	12323	0	908	0	72950	91.67	8858
Nov-20	68359	33600	18938	14352	0	1470	0	68359	100.00	8859
Dec-20	75933	54642	14768	8216	0	4461	0	82086	108.10	2705
Jan-21	64206	31703	22508	8356	0	2611	0	65178	101.51	1733
Feb-21	45812	12162	25414	7207	0	391	0	45174	98.61	2371
Mar-21	48128	23692	17288	3147	0	4753	36885	85765	178.20	1619
Total	**382021**	**204603**	**109830**	**53600**	**0**	**14594**	**36885**	**419512**	**109.81**	

Note: Total 1619 MT Ash stocked (834 MT Ash in ash silo and 785 MT Ash filled in bags) and will be utilized in upcoming Months

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TEST REPORT

ULR No.	--	Report No.	URC /20/11/L-0111
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	12/11/2020
		Customer's Ref.	--
Sample Details	Bore well Water Sample - 1	Location	--
Sample Qty.	2 Lit	Appearance	Colourless
Sampling Date	05/11/2020	Sample Received Date	07/11/2020
Test Started Date	07/11/2020	Test Completion Date	11/11/2020
Sampled By	UniStar Env. & Research Labs	Sampling Method	UERL/CHM/SOP/116
UERL Lab ID.No.	20/11/L-0111		

TEST RESULTS:

DISCIPLINE : Chemical Testing			NAME OF GROUP: Water	
Sr. No.	Parameters	Test Method Permissible	Unit of Measurement	Results
		PHYSICAL QUALITY		
1.	pH @ 25 ° C	IS 3025(Part 11)1983	--	7.63
2.	Conductivity	IS 3025(Part 14)1984	µS/cm	14710
		CHEMICAL QUALITY (In mg/L)		
1.	Chloride as Cl	(APHA 23rd Ed.,2017,4500-Cl)	mg/L	4678.3
2.	Total Dissolved Solids	(APHA 23rd Ed.,2017,2540- C)	mg/L	9864
3.	Carbonate as CaCO3	IS 3025(Part 51)2001	mg/L	23.1
4.	Bicarbonate as CaCO3	IS 3025(Part 51)2001	mg/L	218.5
5.	Mercury as Hg	(APHA 23rd Ed.,2017,3112-B)	mg/L	BDL(MDL:0.001)
6.	Arsenic as As	APHA 23rd Ed.,2017,3114-C	mg/L	BDL(MDL:0.01)
7.	Lead as Pb	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.01)
8.	Chromium as Cr	APHA 23rd Ed.,2017,3125	mg/L	BDL(MDL:0.05)
9.	Cadmium as Cd	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.003)
10.	Iron (as Fe)	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.1)
11.	Zinc (as Zn)	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)
12.	Total Alkalinity	[IS 3025(Part 23)1986, Amd.2]	mg/L	456.3
13	Calcium as Ca	(APHA 23rd Ed.,2017,3500 Ca.B)	mg/L	338.1
14	Magnesium as Mg	(APHA 23rd Ed.,2017,, 3500 Mg.B)	mg/L	237.5
15	Sodium as Na	APHA 23rd Ed.,2017,3500 Na,B	mg/L	1478
16	Potassium as K	APHA 23rd Ed.,2017,3500 K,B	mg/L	83.2
17	Sulphate as SO4-2	IS 3025(Part 24)1986	mg/L	593.2
18	Nitrate as NO3	(APHA 23rd Ed.,2017,4500 NO3-B)	mg/L	22.1
19	Phosphate as PO_4	(APHA 23rd Ed.,2017,4500-P,D)	mg/L	2.8
20	Fluoride as F	(APHA 23rd Ed.,2017,4500 F,D)	mg/L	2.45
21	Copper as Cu	IS 3025(Part 42)1992amd.01, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)
22.	Manganese as Mn	APHA 23rd Ed.,2017,3500 Mn B	mg/L	BDL(MDL:0.1)
23.	Nickel as Ni	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.02)

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

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

Authorized By
(Nitin B. Tandel)
(Technical Manager)

UERL/CHM/F-2/05

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

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TEST REPORT

ULR No.	--	Report No.	URC /20/11/L-0111
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	12/11/2020
		Customer's Ref.	--
Sample Details	Bore well Water Sample - 1	Location	--
Sample Qty.	2 Lit	Appearance	Colourless
Sampling Date	05/11/2020	Sample Received Date	07/11/2020
Test Started Date	07/11/2020	Test Completion Date	11/11/2020
Sampled By	UniStar Env. & Research Labs	Sampling Method	UERL/CHM/SOP/116
UERL Lab ID.No.	20/11/L-0111		

TEST RESULTS:

DISCIPLINE : Chemical Testing			NAME OF GROUP: Water	
Sr. No.	Parameters	Test Method Permissible	Unit of Measurement	Results
		CHEMICAL QUALITY (in mg/L)		
24.	Salinity (ppt)	By Calculation	ppt	8.4
25.	Barium as Ba	AAS Method	mg/L	N.D.
26.	Cobalt as Co	APHA 23rdEd.2017-3500-Co	mg/L	N.D.

Note: **N.D.** = Not Detectable,

******* 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 /20/11/L-0112
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	12/11/2020
		Customer's Ref.	--
Sample Details	Bore well Water Sample - 2	Location	--
Sample Qty.	2 Lit	Appearance	Colourless
Sampling Date	05/11/2020	Sample Received Date	07/11/2020
Test Started Date	07/11/2020	Test Completion Date	11/11/2020
Sampled By	UniStar Env. & Research Labs	Sampling Method	UERL/CHM/SOP/116
UERL Lab ID.No.	20/11/L-0112		

TEST RESULTS:

DISCIPLINE : Chemical Testing			NAME OF GROUP: Water	
Sr. No.	Parameters	Test Method Permissible	Unit of Measurement	Results
		PHYSICAL QUALITY		
1.	pH @ 25 ° C	IS 3025(Part 11)1983	--	7.49
2.	Conductivity	IS 3025(Part 14)1984	µS/cm	16460
		CHEMICAL QUALITY (In mg/L)		
1.	Chloride as Cl	(APHA 23rd Ed.,2017,4500-Cl)	mg/L	4296.3
2.	Total Dissolved Solids	(APHA 23rd Ed.,2017,2540- C)	mg/L	11024
3.	Carbonate as CaCO3	IS 3025(Part 51)2001	mg/L	26.7
4.	Bicarbonate as CaCO3	IS 3025(Part 51)2001	mg/L	178.3
5.	Mercury as Hg	(APHA 23rd Ed.,2017,3112-B)	mg/L	BDL(MDL:0.001)
6.	Arsenic as As	APHA 23rd Ed.,2017,3114-C	mg/L	BDL(MDL:0.01)
7.	Lead as Pb	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.01)
8.	Chromium as Cr	APHA 23rd Ed.,2017,3125	mg/L	BDL(MDL:0.05)
9.	Cadmium as Cd	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.003)
10.	Iron (as Fe)	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.1)
11.	Zinc (as Zn)	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)
12.	Total Alkalinity	[IS 3025(Part 23)1986, Amd.2]	mg/L	389.3
13	Calcium as Ca	(APHA 23rd Ed.,2017,3500 Ca.B)	mg/L	332.1
14	Magnesium as Mg	(APHA 23rd Ed.,2017,, 3500 Mg.B)	mg/L	192.5
15	Sodium as Na	APHA 23rd Ed.,2017,3500 Na,B	mg/L	1906
16	Potassium as K	APHA 23rd Ed.,2017,3500 K,B	mg/L	117.2
17	Sulphate as SO4-2	IS 3025(Part 24)1986	mg/L	744.0
18	Nitrate as NO3	(APHA 23rd Ed.,2017,4500 NO3-B)	mg/L	26.3
19	Phosphate as PO_4	(APHA 23rd Ed.,2017,4500-P,D)	mg/L	3.2
20	Fluoride as F	(APHA 23rd Ed.,2017,4500 F,D)	mg/L	2.30
21	Copper as Cu	IS 3025(Part 42)1992amd.01, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)
22.	Manganese as Mn	APHA 23rd Ed.,2017,3500 Mn B	mg/L	BDL(MDL:0.1)
23.	Nickel as Ni	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.02)

******* 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 /20/11/L-0112
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	12/11/2020
		Customer's Ref.	--
Sample Details	Bore well Water Sample - 2	Location	--
Sample Qty.	2 Lit	Appearance	Colourless
Sampling Date	05/11/2020	Sample Received Date	07/11/2020
Test Started Date	07/11/2020	Test Completion Date	11/11/2020
Sampled By	UniStar Env. & Research Labs	Sampling Method	UERL/CHM/SOP/116
UERL Lab ID.No.	20/11/L-0112		

TEST RESULTS:

DISCIPLINE : Chemical Testing			NAME OF GROUP: Water	
Sr. No.	Parameters	Test Method Permissible	Unit of Measurement	Results
CHEMICAL QUALITY (in mg/L)				
24.	Salinity (ppt)	By Calculation	ppt	7.7
25.	Barium as Ba	AAS Method	mg/L	N.D.
26.	Cobalt as Co	APHA 23rdEd.2017-3500-Co	mg/L	N.D.

Note: **N.D.** = Not Detectable,

******* 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 /20/11/L-0113
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	12/11/2020
		Customer's Ref.	--
Sample Details	Bore well Water Sample - 3	Location	--
Sample Qty.	2 Lit	Appearance	Colourless
Sampling Date	05/11/2020	Sample Received Date	07/11/2020
Test Started Date	07/11/2020	Test Completion Date	11/11/2020
Sampled By	UniStar Env. & Research Labs	Sampling Method	UERL/CHM/SOP/116
UERL Lab ID.No.	20/11/L-0113		

TEST RESULTS:

DISCIPLINE : Chemical Testing			NAME OF GROUP: Water	
Sr. No.	Parameters	Test Method Permissible	Unit of Measurement	Results
		PHYSICAL QUALITY		
1.	pH @ 25 °C	IS 3025(Part 11)1983	--	7.47
2.	Conductivity	IS 3025(Part 14)1984	µS/cm	14770
		CHEMICAL QUALITY (In mg/L)		
1.	Chloride as Cl	(APHA 23rd Ed.,2017,4500-Cl)	mg/L	4325.6
2.	Total Dissolved Solids	(APHA 23rd Ed.,2017,2540- C)	mg/L	9896
3.	Carbonate as CaCO3	IS 3025(Part 51)2001	mg/L	23.1
4.	Bicarbonate as CaCO3	IS 3025(Part 51)2001	mg/L	181.1
5.	Mercury as Hg	(APHA 23rd Ed.,2017,3112-B)	mg/L	BDL(MDL:0.001)
6.	Arsenic as As	APHA 23rd Ed.,2017,3114-C	mg/L	BDL(MDL:0.01)
7.	Lead as Pb	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.01)
8.	Chromium as Cr	APHA 23rd Ed.,2017,3125	mg/L	BDL(MDL:0.05)
9.	Cadmium as Cd	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.003)
10.	Iron (as Fe)	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.1)
11.	Zinc (as Zn)	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)
12.	Total Alkalinity	[IS 3025(Part 23)1986, Amd.2]	mg/L	389.2
13	Calcium as Ca	(APHA 23rd Ed.,2017,3500 Ca.B)	mg/L	281.3
14	Magnesium as Mg	(APHA 23rd Ed.,2017,, 3500 Mg.B)	mg/L	149.3
15	Sodium as Na	APHA 23rd Ed.,2017,3500 Na,B	mg/L	1235
16	Potassium as K	APHA 23rd Ed.,2017,3500 K,B	mg/L	65.2
17	Sulphate as SO4-2	IS 3025(Part 24)1986	mg/L	567.3
18	Nitrate as NO3	(APHA 23rd Ed.,2017,4500 NO3-B)	mg/L	20.5
19	Phosphate as PO_4	(APHA 23rd Ed.,2017,4500-P,D)	mg/L	2.10
20	Fluoride as F	(APHA 23rd Ed.,2017,4500 F,D)	mg/L	1.95
21	Copper as Cu	IS 3025(Part 42)1992amd.01, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)
22.	Manganese as Mn	APHA 23rd Ed.,2017,3500 Mn B	mg/L	BDL(MDL:0.1)
23.	Nickel as Ni	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.02)

******* 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 /20/11/L-0113
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	12/11/2020
		Customer's Ref.	--
Sample Details	Bore well Water Sample - 3	Location	--
Sample Qty.	2 Lit	Appearance	Colourless
Sampling Date	05/11/2020	Sample Received Date	07/11/2020
Test Started Date	07/11/2020	Test Completion Date	11/11/2020
Sampled By	UniStar Env. & Research Labs	Sampling Method	UERL/CHM/SOP/116
UERL Lab ID.No.	20/11/L-0113		

TEST RESULTS:

DISCIPLINE : Chemical Testing			NAME OF GROUP: Water	
Sr. No.	Parameters	Test Method Permissible	Unit of Measurement	Results
		CHEMICAL QUALITY (in mg/L)		
24.	Salinity (ppt)	By Calculation	ppt	7.8
25.	Barium as Ba	AAS Method	mg/L	N.D.
26.	Cobalt as Co	APHA 23rdEd.2017-3500-Co	mg/L	N.D.

Note: **N.D.** = Not Detectable,

******* 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 /20/11/L-0114
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	12/11/2020
		Customer's Ref.	--
Sample Details	Bore well Water Sample - 4	Location	--
Sample Qty.	2 Lit	Appearance	Colourless
Sampling Date	05/11/2020	Sample Received Date	07/11/2020
Test Started Date	07/11/2020	Test Completion Date	11/11/2020
Sampled By	UniStar Env. & Research Labs	Sampling Method	UERL/CHM/SOP/116
UERL Lab ID.No.	20/11/L-0114		

TEST RESULTS:

DISCIPLINE : Chemical Testing			NAME OF GROUP: Water	
Sr. No.	Parameters	Test Method Permissible	Unit of Measurement	Results
		PHYSICAL QUALITY		
1.	pH @ 25 ° C	IS 3025(Part 11)1983	--	7.72
2.	Conductivity	IS 3025(Part 14)1984	µS/cm	15660
		CHEMICAL QUALITY (In mg/L)		
1.	Chloride as Cl^-	(APHA 23rd Ed.,2017,4500-Cl)	mg/L	4526.3
2.	Total Dissolved Solids	(APHA 23rd Ed.,2017,2540- C)	mg/L	10326
3.	Carbonate as $CaCO_3$	IS 3025(Part 51)2001	mg/L	27.3
4.	Bicarbonate as $CaCO_3$	IS 3025(Part 51)2001	mg/L	159.3
5.	Mercury as Hg	(APHA 23rd Ed.,2017,3112-B)	mg/L	BDL(MDL:0.001)
6.	Arsenic as As	APHA 23rd Ed.,2017,3114-C	mg/L	BDL(MDL:0.01)
7.	Lead as Pb	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.01)
8.	Chromium as Cr	APHA 23rd Ed.,2017,3125	mg/L	BDL(MDL:0.05)
9.	Cadmium as Cd	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.003)
10.	Iron (as Fe)	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.1)
11.	Zinc (as Zn)	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)
12.	Total Alkalinity	[IS 3025(Part 23)1986, Amd.2]	mg/L	453.2
13	Calcium as Ca	(APHA 23rd Ed.,2017,3500 Ca.B)	mg/L	346.3
14	Magnesium as Mg	(APHA 23rd Ed.,2017,, 3500 Mg.B)	mg/L	186.2
15	Sodium as Na	APHA 23rd Ed.,2017,3500 Na,B	mg/L	1510
16	Potassium as K	APHA 23rd Ed.,2017,3500 K,B	mg/L	89.3
17	Sulphate as SO4-2	IS 3025(Part 24)1986	mg/L	693.3
18	Nitrate as NO3	(APHA 23rd Ed.,2017,4500 NO3-B)	mg/L	26.5
19	Phosphate as PO_4	(APHA 23rd Ed.,2017,4500-P,D)	mg/L	2.9
20	Fluoride as F	(APHA 23rd Ed.,2017,4500 F,D)	mg/L	2.35
21	Copper as Cu	IS 3025(Part 42)1992amd.01, (APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.05)
22.	Manganese as Mn	APHA 23rd Ed.,2017,3500 Mn B	mg/L	BDL(MDL:0.1)
23.	Nickel as Ni	(APHA 23rd Ed.,2017,3111-B)	mg/L	BDL(MDL:0.02)

******* 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 /20/11/L-0114
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	12/11/2020
		Customer's Ref.	--
Sample Details	Bore well Water Sample - 4	Location	--
Sample Qty.	2 Lit	Appearance	Colourless
Sampling Date	05/11/2020	Sample Received Date	07/11/2020
Test Started Date	07/11/2020	Test Completion Date	11/11/2020
Sampled By	UniStar Env. & Research Labs	Sampling Method	UERL/CHM/SOP/116
UERL Lab ID.No.	20/11/L-0114		

TEST RESULTS:

DISCIPLINE : Chemical Testing			NAME OF GROUP: Water	
Sr. No.	Parameters	Test Method Permissible	Unit of Measurement	Results
		CHEMICAL QUALITY (in mg/L)		
24.	Salinity (ppt)	By Calculation	ppt	8.0
25.	Barium as Ba	AAS Method	mg/L	N.D.
26.	Cobalt as Co	APHA 23rdEd.2017-3500-Co	mg/L	N.D.

Note: **N.D.** = Not Detectable,

******* 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 /21/03/APML-0225
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	22/03/2021
Sample Details	Bore well Water Sample - 1	Customer's Ref.	--
Sample Qty.	2 Lit	Location	--
Sampling Date	10/03/2021	Appearance	Colourless
Test Started Date	UniStar Env. & Research Labs	Sample Received Date	11/03/2021
Sampled By	13/03/2021	Appearance of Sample	Colorless
UERL Lab ID.No.	21/03/APML-0225	Test Completion Date	20/03/2021

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)	15275
3.	Total Dissolved Solids	(APHA 23rd Ed.,2017,2540- C)	mg/L	10416
		GENERAL CHEMICAL PARAMETERS		
1.	Chloride as Cl	(APHA 23rd Ed.,2017,4500-Cl)	mg/L	4776
2.	Carbonate as CaCO3	IS 3025(Part 51)2001	mg/L	24.1
3.	Bicarbonate as CaCO3	IS 3025(Part 51)2001	mg/L	196.4
4.	Total Alkalinity	[IS 3025(Part 23)1986, Amd.2]	mg/L	451.0
5.	Calcium as Ca	(APHA 23rd Ed.,2017,3500 Ca.B)	mg/L	359.7
6.	Magnesium as Mg	(APHA 23rd Ed.,2017,, 3500 Mg.B)	mg/L	244.1
7.	Sodium as Na	APHA 23rd Ed.,2017,3500 Na,B	mg/L	1749.3
8.	Potassium as K	APHA 23rd Ed.,2017,3500 K,B	mg/L	104.6
9.	Sulphate as SO4-2	IS 3025(Part 24)1986	mg/L	656.9
10.	Nitrate as NO3	(APHA 23rd Ed.,2017,4500 NO3-B)	mg/L	27.1
11.	Phosphate as PO_4	(APHA 23rd Ed.,2017,4500-P,D)	mg/L	2.87
12.	Fluoride as F	(APHA 23rd Ed.,2017,4500 F,D)	mg/L	2.52
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:0.03)
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)

UERL/CHM/F–2/05

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TEST REPORT

ULR No.	--	Report No.	URC /21/03/APML-0225
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	22/03/2021
		Customer's Ref.	--
Sample Details	Bore well Water Sample - 1	Location	--
Sample Qty.	2 Lit	Appearance	Colourless
Sampling Date	10/03/2021	Sample Received Date	11/03/2021
Test Started Date	UniStar Env. & Research Labs	Appearance of Sample	Colorless
Sampled By	13/03/2021	Test Completion Date	20/03/2021
UERL Lab ID.No.	21/03/APML-0225		

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
Desai
(Jagruti P. Desai)
(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 /21/03/APML-0225
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	22/03/2021
Sample Details	Bore well Water Sample - 1	Customer's Ref.	--
Sample Qty.	2 Lit	Location	--
Sampling Date	10/03/2021	Appearance	Colourless
Test Started Date	UniStar Env. & Research Labs	Sample Received Date	11/03/2021
Sampled By	13/03/2021	Appearance of Sample	Colorless
UERL Lab ID.No.	21/03/APML-0225	Test Completion Date	20/03/2021

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	8.67
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
Desai
(Jagruti P. Desai)
(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 /21/03/APML-0226
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	22/03/2021
		Customer's Ref.	--
Sample Details	Bore well Water Sample - 2	Location	--
Sample Qty.	2 Lit	Appearance	Colourless
Sampling Date	10/03/2021	Sample Received Date	11/03/2021
Test Started Date	UniStar Env. & Research Labs	Appearance of Sample	Colorless
Sampled By	13/03/2021	Test Completion Date	20/03/2021
UERL Lab ID.No.	21/03/APML-0226		

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	--	7.33
2.	Conductivity	IS 3025(Part 14)1984	(µS/cm)	16870
3.	Total Dissolved Solids	(APHA 23rd Ed.,2017,2540- C)	mg/L	11530
		GENERAL CHEMICAL PARAMETERS		
1.	Chloride as Cl	(APHA 23rd Ed.,2017,4500-Cl)	mg/L	4329.4
2.	Carbonate as CaCO3	IS 3025(Part 51)2001	mg/L	33.9
3.	Bicarbonate as CaCO3	IS 3025(Part 51)2001	mg/L	178.3
4.	Total Alkalinity	[IS 3025(Part 23)1986, Amd.2]	mg/L	414.8
5.	Calcium as Ca	(APHA 23rd Ed.,2017,3500 Ca.B)	mg/L	347.8
6.	Magnesium as Mg	(APHA 23rd Ed.,2017,, 3500 Mg.B)	mg/L	211.2
7.	Sodium as Na	APHA 23rd Ed.,2017,3500 Na,B	mg/L	2050.2
8.	Potassium as K	APHA 23rd Ed.,2017,3500 K,B	mg/L	121.7
9.	Sulphate as SO4-2	IS 3025(Part 24)1986	mg/L	811.9
10.	Nitrate as NO3	(APHA 23rd Ed.,2017,4500 NO3-B)	mg/L	29.8
11.	Phosphate as PO_4	(APHA 23rd Ed.,2017,4500-P,D)	mg/L	3.2
12.	Fluoride as F	(APHA 23rd Ed.,2017,4500 F,D)	mg/L	2.91
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:0.03)
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 /21/03/APML-0226
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	22/03/2021
Sample Details	Bore well Water Sample - 2	Customer's Ref.	--
Sample Qty.	2 Lit	Location	--
Sampling Date	10/03/2021	Appearance	Colourless
Test Started Date	UniStar Env. & Research Labs	Sample Received Date	11/03/2021
Sampled By	13/03/2021	Appearance of Sample	Colorless
UERL Lab ID.No.	21/03/APML-0226	Test Completion Date	20/03/2021

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
Jagruti P. Desai
(Sr. Chemist)

Authorized By
(Nitin B. Tandel)
(Technical Manager)

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TEST REPORT

ULR No.	--	Report No.	URC /21/03/APML-0226
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	22/03/2021
		Customer's Ref.	--
Sample Details	Bore well Water Sample - 2	Location	--
Sample Qty.	2 Lit	Appearance	Colourless
Sampling Date	10/03/2021	Sample Received Date	11/03/2021
Test Started Date	UniStar Env. & Research Labs	Appearance of Sample	Colorless
Sampled By	13/03/2021	Test Completion Date	20/03/2021
UERL Lab ID.No.	21/03/APML-0226		

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,

(Jagruti P. Desai)
(Sr. Chemist)

Authorized By

(Nitin B. Tandel)
(Technical Manager)

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TEST REPORT

ULR No.	--	Report No.	URC /21/03/APML-0227
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	22/03/2021
		Customer's Ref.	--
Sample Details	Bore well Water Sample - 3	Location	--
Sample Qty.	2 Lit	Appearance	Colourless
Sampling Date	10/03/2021	Sample Received Date	11/03/2021
Test Started Date	UniStar Env. & Research Labs	Appearance of Sample	Colorless
Sampled By	13/03/2021	Test Completion Date	20/03/2021
UERL Lab ID.No.	21/03/APML-0227		

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	--	7.72
2.	Conductivity	IS 3025(Part 14)1984	(µS/cm)	15024
3.	Total Dissolved Solids	(APHA 23rd Ed.,2017,2540- C)	mg/L	10064
		GENERAL CHEMICAL PARAMETERS		
1.	Chloride as Cl	(APHA 23rd Ed.,2017,4500-Cl)	mg/L	4688.2
2.	Carbonate as CaCO3	IS 3025(Part 51)2001	mg/L	30
3.	Bicarbonate as CaCO3	IS 3025(Part 51)2001	mg/L	185.7
4.	Total Alkalinity	[IS 3025(Part 23)1986, Amd.2]	mg/L	408.1
5.	Calcium as Ca	(APHA 23rd Ed.,2017,3500 Ca.B)	mg/L	303.4
6.	Magnesium as Mg	(APHA 23rd Ed.,2017,, 3500 Mg.B)	mg/L	159.6
7.	Sodium as Na	APHA 23rd Ed.,2017,3500 Na,B	mg/L	1346
8.	Potassium as K	APHA 23rd Ed.,2017,3500 K,B	mg/L	97.4
9.	Sulphate as SO4-2	IS 3025(Part 24)1986	mg/L	660.5
10.	Nitrate as NO3	(APHA 23rd Ed.,2017,4500 NO3-B)	mg/L	23.8
11.	Phosphate as PO_4	(APHA 23rd Ed.,2017,4500-P,D)	mg/L	2.14
12.	Fluoride as F	(APHA 23rd Ed.,2017,4500 F,D)	mg/L	2.09
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:0.03)
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 /21/03/APML-0227
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	22/03/2021
		Customer's Ref.	--
Sample Details	Bore well Water Sample - 3	Location	--
Sample Qty.	2 Lit	Appearance	Colourless
Sampling Date	10/03/2021	Sample Received Date	11/03/2021
Test Started Date	UniStar Env. & Research Labs	Appearance of Sample	Colorless
Sampled By	13/03/2021	Test Completion Date	20/03/2021
UERL Lab ID.No.	21/03/APML-0227		

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
Desai
(Jagruti P. Desai)
(Sr. Chemist)

Authorized By
(Nitin B. Tandel)
(Technical Manager)

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TEST REPORT

ULR No.	--	Report No.	URC /21/03/APML-0227
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	22/03/2021
		Customer's Ref.	--
Sample Details	Bore well Water Sample - 3	Location	--
Sample Qty.	2 Lit	Appearance	Colourless
Sampling Date	10/03/2021	Sample Received Date	11/03/2021
Test Started Date	UniStar Env. & Research Labs	Appearance of Sample	Colorless
Sampled By	13/03/2021	Test Completion Date	20/03/2021
UERL Lab ID.No.	21/03/APML-0227		

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	8.47
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,
(Jagruti P. Desai)
(Sr. Chemist)

Authorized By
(Nitin B. Tandel)
(Technical Manager)

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TEST REPORT

ULR No.	--	Report No.	URC /21/03/APML-0228
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	22/03/2021
		Customer's Ref.	--
Sample Details	Bore well Water Sample - 4	Location	--
Sample Qty.	2 Lit	Appearance	Colourless
Sampling Date	10/03/2021	Sample Received Date	11/03/2021
Test Started Date	UniStar Env. & Research Labs	Appearance of Sample	Colorless
Sampled By	13/03/2021	Test Completion Date	20/03/2021
UERL Lab ID.No.	21/03/APML-0228		

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)	15973
3.	Total Dissolved Solids	(APHA 23rd Ed.,2017,2540- C)	mg/L	10714
		GENERAL CHEMICAL PARAMETERS		
1.	Chloride as Cl	(APHA 23rd Ed.,2017,4500-Cl)	mg/L	4692.3
2.	Carbonate as CaCO3	IS 3025(Part 51)2001	mg/L	29.7
3.	Bicarbonate as CaCO3	IS 3025(Part 51)2001	mg/L	175.6
4.	Total Alkalinity	[IS 3025(Part 23)1986, Amd.2]	mg/L	468.7
5.	Calcium as Ca	(APHA 23rd Ed.,2017,3500 Ca.B)	mg/L	375.8
6.	Magnesium as Mg	(APHA 23rd Ed.,2017,, 3500 Mg.B)	mg/L	204
7.	Sodium as Na	APHA 23rd Ed.,2017,3500 Na,B	mg/L	1652.3
8.	Potassium as K	APHA 23rd Ed.,2017,3500 K,B	mg/L	97.2
9.	Sulphate as SO4-2	IS 3025(Part 24)1986	mg/L	758.9
10.	Nitrate as NO3	(APHA 23rd Ed.,2017,4500 NO3-B)	mg/L	29.4
11.	Phosphate as PO_4	(APHA 23rd Ed.,2017,4500-P,D)	mg/L	3.01
12.	Fluoride as F	(APHA 23rd Ed.,2017,4500 F,D)	mg/L	2.91
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:0.03)
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 /21/03/APML-0228
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	22/03/2021
		Customer's Ref.	--
Sample Details	Bore well Water Sample - 4	Location	--
Sample Qty.	2 Lit	Appearance	Colourless
Sampling Date	10/03/2021	Sample Received Date	11/03/2021
Test Started Date	UniStar Env. & Research Labs	Appearance of Sample	Colorless
Sampled By	13/03/2021	Test Completion Date	20/03/2021
UERL Lab ID.No.	21/03/APML-0228		

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
Jagruti P. Desai
(Jagruti P. Desai)
(Sr. Chemist)

Authorized By
(Nitin B. Tandel)
(Technical Manager)

UERL/CHM/F–2/05

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

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MoEF&CC (GOI) Recognized Environmental Laboratory under the EPA-1986 (12.01.2020 to 17.03.2023) | QCI-NABET Accredited EIA Consultant Organization | GPCB Recognized Environmental Auditor (Schedule-11) | ISO 9001 : 2015 Certified Company | ISO 45001 : 2018 Certified Company

TEST REPORT

ULR No.	--	Report No.	URC /21/03/APML-0228
Name & Address of Customer	M/s. Adani Power (Mundra) Ltd. Village: Tunda &Siracha, Tal. Mundra, Dist.: Kutch. GUJARAT – 370 435.	Date of Report	22/03/2021
		Customer's Ref.	--
Sample Details	Bore well Water Sample - 4	Location	--
Sample Qty.	2 Lit	Appearance	Colourless
Sampling Date	10/03/2021	Sample Received Date	11/03/2021
Test Started Date	UniStar Env. & Research Labs	Appearance of Sample	Colorless
Sampled By	13/03/2021	Test Completion Date	20/03/2021
UERL Lab ID.No.	21/03/APML-0228		

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	8.42
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
Desai
(Jagruti P. Desai)
(Sr. Chemist)

Authorized By
(Nitin B. Tandel)
(Technical Manager)

UERL/CHM/F–2/05

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

Expenditure for Environmental Protection & CER		
		(Fig. in Rs. Lacs)
Sr. No.	**Particular**	**Expenditure from October'20 to March' 21**
1	Rural Development/CER/CSR Activities	1171.45
2	Green belt development	69.95
3	Legal, Consent Fee, GPCB lab bills & Environment Audit	2,65
4	Hazardous waste disposal cost	0.91
5	Treatment and Disposal cost (Wastewater & Sewage Treatment)	67.46
6	Maintenance cost of ESP & FGD (Material Cost)	1661.99
7	Third party monitoring and Equipment & instruments maintenance, materials, communication cost.	32.77
8	Insurance, training, and external environmental management	0.12
	Total	**3007.3**

adani Foundation

Annual Report
2020-21

CSR KUTCH

2020-21

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

Our journey

The year 2020-21 has passed off with great experience and new challenges for Adani Foundation due to Covid 19 Pandemic. Adani Foundation team has started working just after one week of lockdown to keep commitment towards the community. As a part of dignity of workforce team has done remarkable work for fresh food and ration kit supply to retain them at workplace with safe and comfortable environment. Regular visit to senior citizen home and running MHCU by medical officers was not less challenging. Our women SHG has prepared more than 1 lac mask for Taluka Health office, Anganwadi Staff, Police Staff, Custom and coastguard and Education staff. Adani Hospital – Non Covid Hospital and GKGH Bhuj Hospital – Covid Care Hospital remained opened 24x7 throughout the year which is matter of great proud.

Current year Sea weed culture and Natural Farming Promotion were the new concepts which will be planned with five years vision. Mangroves costal biodiversity, water harvesting structures and Tissue culture will have sharp turn with proper documentation and demarcation. Adani Vidya Mandir has proven best in education by reaching to unreached through digital technology, happy to see the fisherman students studying sincerely sitting in fisherfolk settlements by operating tablets. New Era touched upon Framers too who are a part of discussion about natural farming on Zoom application. “Vadil Swasthaya Yojna” and “Suposhan” were in last execution year as a Project but both project will be with us by sourcing and moral support by linkages with different Government Scheme.

Happy to share – under guidance of seniors proper frame work was developed for supporting community as a bridge between various Government schemes and needy people by “Community Resource Centre” its true need and real sustainable way. Fisherman and women employment sourcing created very positive impact as a regular source of income for them.

Adani skill Development center entered into MOU with KSKV Kutchh University for various skill development trainings. 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 Kachchh also.

Success is due to present of torch barer and mentor in life who is Respected Dr. Priti Adani. If you have mentor like her in life, she can turn a Mess into message. A Test into a Testimony, A Victim into Victory! We heartly thanks our Rakshit bhai, Respected Gadhvi sir and Respected PNR sir for guidance and motivation.

We wish all the very best to whole Adani Foundation Parivar !

INDEX

Education (SDG - 4/4.a)

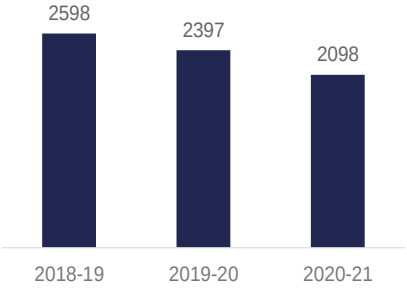
The future of India depends upon the quality of education imparted to our children. We believe that it is the joint responsibility of the Government and citizens to improver school education. With an aim to enhance the quality of primary education in Kutch District, Adani Foundation proposed to adopt 17 government schools located at Mundra Taluka under the project '*Utthan*' as a pilot project. By this intervention, Adani Foundation seeks to facilitate; Focus on 'Priya' students and celebrate their progress, Make learning joyful, provides adequate resources and facilities, strengthen the curricula to provide basic skills, especially in the areas of literacy, numeracy and skills for life and focus on Teachers' capacity building. **(SDG - 4/4.a)**

Utthan

How Utthan Sahayaks overcame/overcoming the Pandemic

In COVID 19 Pandemic, when the schools were completely closed, education went on mobile platform and students are still dependent on mobile internet for their education.

- ✓ During the initial phase of lockdown Utthan Sahayaks reached Priya Vidyarthis through series of curated SMS and WhatsApp messages, they share text/video/audio content focused on hands-on learning activities.
- ✓ Initial approach realized us that we need to find another way to touch our audience Utthan Sahayaks convert this challenge into opportunity. They make themselves tech savvy by learning how to conduct classes on various platform especially on Google classroom.



Our out reach for Utthan project

- ✓ In pandemic times ,Priya Vidyarthis' meet were scheduled on Google meet platform. Primarily Utthan Sahayaks faced the challenges that students are unable to meet them virtually due to the single smart phone availability in the family.
- ✓ Here with us a only solution to make them study available at their door step by following all the guidelines suggested by government to maintain social distances.
- ✓ From October onwards Utthan sahayks approached their students by taking physical classes at their respective residence.

Year	No. of school	No. of village	No. of Girls	No. of Boys	Total
2018-19	17	7	1318	1280	2598
2019-20	17	7	1227	1170	2397
2020-21	17	7	1069	1029	2098

Utthan – during pandemic

Pandemic situation has challenged the functioning of various activities of the project but team Utthan and Adani Foundation adapted to the transitions required to continue with its outreach. With the travel restrictions, team Utthan has adopted all the protocols assigned by the Adani Foundation and the health authorities and has continued both its offline activities while adopting online methods to carryout its activities especially to reach out our students.

Capacity Building Program

- Usage of Google meet and Google classroom
- Art of living
- Individual learning
- Digital Bookmarks
- Vedic maths
- Gandhian Education Philosophy

Competition

- Essay writing
- Ganpati idol making
- Doha recitation
- Garba decoration
- Christmas celebration
- Makarsankranti celebration

Utthan
Additional achievements

Solar panel has been installed in 17 schools of Utthan – so now the schools will be using renewable energy. Support of teachers and Principal during installation was substantial. This is changing and challenging step for Utthan Project to convert whole school running on renewable energy. In coordination with Mundra Solar Panel manufacturing unit – systems installed with inverters.

Utthan is not only deals with Education – but the main strength of the Project is Sahayak. Sahayaks remain in touch with parents and make them understand the value of education. Apart from it, Utthan Sahayaks motivated more than 700 parents of girl students to open “Sukanya Samriddhi Bank Account” for their bright future

Utthan – Capacity Building Programmes

Staff Training - Adani Schools

Date: Saturday, February 20, 2021
10.00 hrs to 12.30 hrs
Platform: ZOOM

Topic: A Blissful Journey: From Entropy to Stillness

Resource Person: **Mr Saurabh Beniwal**

15+ years of Corporate and Educational Training Experience during association with various organizations like Next Education, Edusemp, Airtel, Intellinet PAN India. He has been associated with Indianica Learning Pvt. Ltd. as National Head – Teacher Empowerment Initiatives, conducted more than 700highly energetic Workshops, Sessions and counselling sessions for Teachers, Students, Principals and Parents on various topics listed in profile below. Served more than 1,00,000 teachers, students and Parents across nation.

Timings	Discussion Point	Material/Activity
10:00 to 10:30 hrs	Presence of Mind, Comfort Zone	PPT presentation, Discussion
10:30 to 11 hrs	Types of learners and how to deal with them, 3 C's of Life	PPT, Discussion and Activity
11 to 11:30 hrs	Human Experiential Model, Effective Communication with blocks to listening, Power of positive thinking	PPT, Story, Discussion
11:30 to 12 Noon	Goal Setting for teachers, communication Gap, Outer world Vs Inner World	PPT, Video, Story, Discussion
12:00 Noon to 12:30 hrs	Material Vs Spiritual Knowledge, Meditation	PPT, Guided musical meditation for 15 minutes

Utthan - Impact

IMPACT OF THE PROGRAM

- **Beneficiary of Online classes**
  - 17 Utthan Sahayaks
  - 17 Gov. Primary Schools
  - 2098 total students
- **Weekly Content of IT and Physical Education**
  - 106 Gov. Pri. School
  - 35000+ students
- **Virtual Mothers meet**
  - 500+ Mothers attended meeting on Google meet
- **Capacity Building Program**
  - 70+ Webinar attended by Utthan Sahayak
  - 10 Seminar/ Workshop
- **Competition /Celebration**
  - 248 Students took part virtually

Uthhan – Testimonials

Confessions

‘Solar Panel installation in Uthhan Schools is biggest step towards best usage of renewable energy. Now our students can study comfortably during absence of electricity and not only this – student can understand value of solar energy too”

Principal,

Mundra, Kutch, Gujarat

‘Utthan Sahayaks with the help of customized curriculum and structured time table meet huge success to achieve the main objective of the program

In corona pandemic Uthhan Sahayak acted as a main force for students to remain active during lockdown through home visits, various competitions and E-events.

In future, Utthan will be sound support system for Government Schools of Mundra

I wish all the best to Team Uthhan

Haresh Patel
Taluka Primary Education Officer
Kachchh- Bhuj

Confessions

'During this pandemic period Utthan Sahayaks are doing very commendable job. We will receive an encouraging feedback from Parents too. Project Utthan has made a positive impact on our students as well as in school too.

Mahendrasingh Solanki
Principal,
Zarpara Shaala no. 3
Mundra, Kutch, Gujarat

'Education is what builds a nation generation after generation and the process begins early on; fist at homes/communities and then in the schools. With an aim to enhance the quality education in government primary school in Kutch district project Utthan launched by Adani Foundation with the close monitoring by GoG as a pilot project with 17 schools at Mundra.

After the completion of 2 years, project marks a very positive impression not only in school but also in community. Utthan Sahayaks played a vital role to transfer Priya *Vidyarthi* into main stream. School culture and environment has become more advanced and techno based with the up skilling of government teachers through various capacity building program. Attendance of schools has increased due to active Mothers meet and SMC meetings.

I am sure in near future with the active involvement of this project performance level of government primary school shall further improve.

My good wishes and support are always with the team!'

Prabhav Joshi (IAS)
District Development Officer
Kachchh- Bhuj

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.

Adani Vidya Mandir, Bhadreshwar

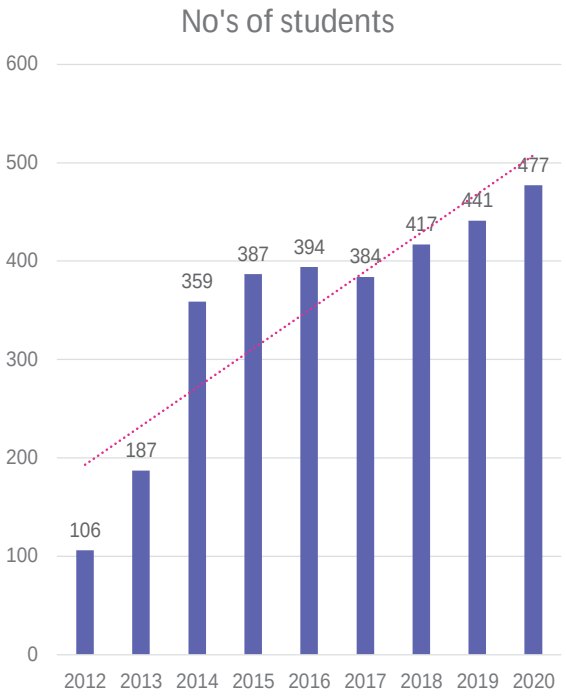
Adani Vidya Mandir Bhadreshwar Gujrat Board Standard 10th Examination Result is 82.60% (19 students have passed the examination out of 23). Adani Foundation will take all responsibility of further study of students with respect to their interest.

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.

AVMB STD - 10 SECOND BATCH RESULT
Year 2020-2021

SR NO	GRADE	STUDENTS
1	Above 80 %	00
2	Above 70 %	02
3	Above 60 %	05
4	Above 50 %	07
5	Above 40 %	05
6	Fail	04
	TOTAL	23



Activities Covered

- Admission process of Std 1 students through draw system.
- Online Class through What Sapp and YouTube video
- DD Girnar Timetable intimation and & Follow-Up
- Regular home visit for homework and lessons with PPE's by Teachers
- Textbook support to students of all classes.
- 10th standard students divided into small Group and Mentoring by AVMB Teachers.
- Unit test conducted as per GSEB circular for the students
- Offline Examination for class 3rd to 10th
- G Suite & Diksha Training for Teachers
- Opened G-Mail Account of Each Child
- **Tablet support to 10th class students for Online Classes by Employees Volunteering Programme**
- Self Learning Material Distribution to 1st to 9th standard students who don't have access for online education.
- Parents Meeting : Regular basis
- Start Remedial Classes at 3 villages with Following all Gov Covid Guide
- reopens Schools class 9th to 10th Standard
- Day Celebration (Fit India, Children day and Mathematic day & Republic day) Virtually and Physically to get rid off from the Covid Stigma

Community Health (SDG - 3/3.8)

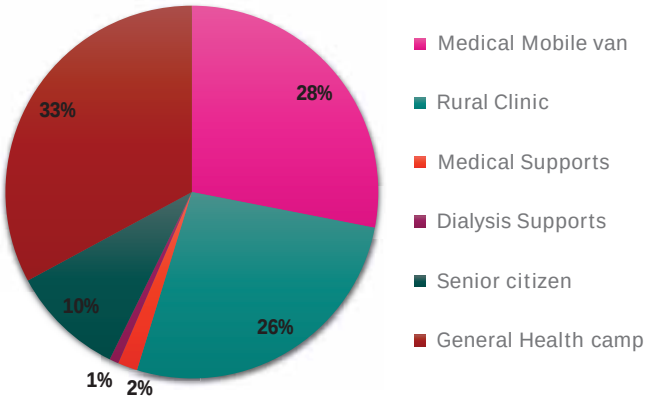
Access to quality healthcare is a fundamental right of every individual

Health plays a crucial role in transforming people's lives. Throughout the year, COVID-19 has taught us the lesson about the importance of health. Access to quality health care gives a fair chance to lead healthy, productive lives. Healthy people can utilize opportunities available to them.

Community Health

CH All Project Patient Details			
Project	Direct Beneficiary	In-Direct Beneficiary	Remarks
Medical Mobile van	16611	66476	33 Villages
Rural Clinic	15797	63192	11 Villages
Medical Supports	1008	5040	63 Villages
Dialysis Supports	474	2370	63 Villages
Senior citizen	5836	17508	63 Villages
Health camp	19461	58383	11 Villages
Total	59187	212979	

Direct Beneficiary



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

Adani Foundation relentlessly working for same in each health core area through various kind of health activities i.e. Mobile Health Care Unit, Rural Clinics, Special Innovative Projects i.e. Health Card to Senior Citizens, "Project Abhimanyu" and support to dialysis patients projects. Adani Foundation had also organized special medical camps during Corona pandemic

Rural Clinic & Mobile Health Care unit

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

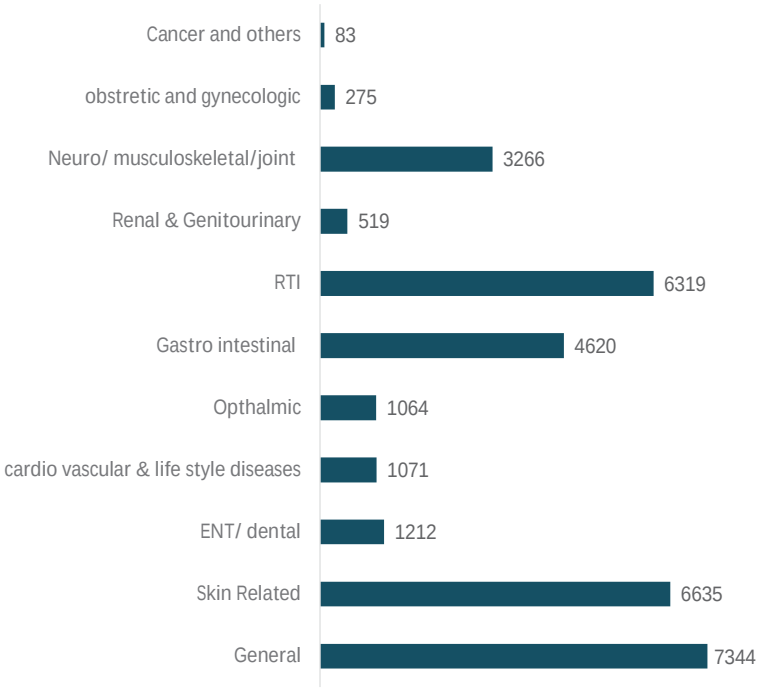
Mobile Health Care Units and Rural Clinic Services are deployed with the objective of providing basic healthcare facilities to remote rural areas as well as poor peoples. The service is being executed by adani foundation is to reduce travel time, hardships and expenses.

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

Rural Dispensaries are established where there is a gap in the healthcare services. The Adani Foundation operates Rural Dispensaries in 7 villages of Mundra block, 03 villages of Anjar block and 1 clinics in Mandvi Block. Mobile dispensary and rural clinics provide health services with token charge of 10/- rupees per patient daily by a doctor and a volunteer.

During this year total 16611 beneficiaries 6141 male and 10470 female were benefitted by Mobile van and total 15797 beneficiaries 7128 male and 8669 female were benefitted benefits by Rural clinics.

Community Health – Disease wise Distribution



Health Cards to Senior Citizens

Senior citizens often face difficulties in getting treatment for want of financial, social and moral support. In this stage of life is there is need special care for health and warmth hence Adani foundation has started senior citizen project in Mundra Block since 10 years. The main objective is to provide specialized, timely and hassle-free healthcare services according to the needs of senior citizens. The initiative also encourages them to pay attention to their health and promotes preventive healthcare.

During the year 2020-21, total 5836 transactions were done by 8711 card holders of 68 villages of Mundra Taluka. They received cash less medical services under this project.
The limit for the beneficiary has been set Rs.8000/- in exit year. the senior citizens get emergency medical care at Adani Hospital, Mundra and refer to GKGH, Hospital ,Bhuj in Emergency.

Specialty Camps

General health camps, Pediatric Camp, breast and cervical cancer screening camp and surgical health camps was organized at frequently to meet the specific requirements of the community and in disease outbreak season with following the guideline of COVID-19.
In the year of 2020 -21 total 97 people had been benefitted by various kind of camp and needy and screened patients are treated in Adani Hospital.

Sr. Citizen status Year-2011 to 2020-21											
Number of Villages	Total Cards	Total Survey	Pending Renew Cards	EXP	Green cards	Blue Cards	BPL Cards	APL Cards	No Ration Cards	RSBY Cards	MA Cards
68	8711	7095	901	715	6328	767	2493	4555	47	77	222

Medical Support Detail

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

Partial Medical Support had been given to 1008 beneficiaries of Mundra, Mandvi and Anjar Block at Adani hospital, Mundra. where as in the Critical cases after stable them we refer them to GKGH, BHUJ for further treatment.

Dialysis Support

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

Hence, the Foundation has undertaken a programme to providing dialysis treatment to help the extremely needy patients to live a healthy life. During this year, 6 patients were supported for regular dialysis (twice a week) with partial support.

Ukado & Vitamin-C Tablets Distribution

Covid-19 pandemic is at the peak level And there is no any specific treatment But as preventive measure and immunity booster we had started Ayurveda UKADO distribution at various public spot in Mundra.

The TDO, THO, Flywing foundation, Ayurveda Department had support and coordinate in UKADO and Vitamin-C tablets distribution activities. Total **18240 people had get benefits of UKADO and Vitamin-C tablets.**

Machhimar Shudhh Jal Yojana (SDG 6/6.4)

To reduce water born disease and women drudgery to get water, Potable water is provided to the fishermen communities at different vasahat through water tanker since 8 years.

Sr.	Vasahat	Family	Requirement Per day	Remarks
1	Luni	116	15000	9 Months
2	Bavdi Bandar	107	15000	9 Months
3	Kutdi Bandar	118	15000	9 Months
4	Randh Bandar	245	25000	9 Months
5	Zarapra Vasahat	90	5000	12 Months
6	Vira bandar	80	--	Linkages with GWIL
7	Juna bandar	160	--	Linkage with Mundra GP
8	Ghavarvaro Banada	60	--	Linkages with GWIL
9	Zarapra chacha	55	--	Linkages with Port GWIL
	TOTAL	1031		

Community Health Bhuj (SDG 3/3.8)

- Adani Foundation Team has initiated coordination with GKGH hospital since 2014 and established a reception area for the smooth patient coordination and preparation for the social networking program.
- GKGH Hospital is Covid Care Hospital since 22nd March 2020. Adani Foundation staff members supported in patient counselling, coordinating and supporting for dead body covid care van.
- Total 3368 Covid patients got treatment from overall Ketch 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 809 dead bodies privileged till now to different locations in Kutch including Covid Patients.
- Mahiti Setu is linkages between various Government Schemes and beneficiaries. Through Mahiti Setu sourcing of 2378 beneficiaries and linkages with more than 780 cards of MAA Yojna and Ayushman Yojna

Community Health - Impact

IMPACT OF THE PROGRAM

Benefits of MHCU and Rural Clinics
- 44 Villages
- 23000 Population Coverage
- Saving of Rs. 150 per day
- Total Revenue saved – Rs. 44.26 Lacs

Senior Citizen Health Card
- All Senior Citizens of Mundra – 8711 cards
- Unique Project with focus on preventive care
- Revenue generated @ Rs. 63 Lacs

Corona pandemic Times
- More than 12 camps of Ukala Distribution
- Outreach @ 2,50,000 for awareness and immunity boosting methods

Potable Water to Fisehrfolk
- Covering 676 Families with 75000 liters per day water for drinking purpose at Vasahat
- 3 Vasahat became self sustain with coordination of Gram Panchayat

AHMPL
- Total 20959 patients benefited in year 2020-21 from 55 different villages .
- Goodwill created as a only hospital remained 24x7 opened during whole year of pandemic

Environmental Sustainability

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.

Water conservation Projects i.e. Roof Top Rain Water Harvesting, Desilting of Check dams, Bore Well Recharge and Pond deepening were taken up in past years, review and monitoring of all water harvesting structures had been taken up. Including this a big recharge operation by bunding was taken up for Zarpara village as rainfall was very good current year

To make connections between human actions and the level of biological diversity found within a habitat and/or ecosystem, this year we launch project “Sanrakshan” in coordination with GUIDE and Sahjeevan.

Water Conservation Projects (SDG 6/6.6)

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

- A large number of water harvesting structure (18 Nos. of check dams in coordination with salinity department)
- Ground recharge activities (pond deepening work for more than 52 ponds) individually and 26 ponds under Sujlam Suflam Jal Abhiyan were built leading to a significant increase in water table and higher returns to the farmers
- Roof Top Rain Water Harvesting 54 Nos. which is having 10,000 litre storage which is sufficient for one year drinking water purpose for 5 people family.
- Recharge Bore well 75 Nos which is best ever option to
- Drip Irrigation 823 Farmers benefitted in coordination with Gujrat Green Revolution Company
- Bund construction on way of Nagmati River could save more than 575 MCFT water quantity which recharged in ground due to which borewell depth decreased by 50-100 Ft in Zarpara, Bhujpur and Navinal Vadi Vistar.

Jiv Srishti Saurakshan Yojana (SDG 15/15.9)

Bio Diversity Park – Mundra

Ecological greenbelt development plan expects to attracts and provide habitats for many species of major faunal groups such as amphibians, reptiles, birds (terrestrial and aquatic), butterflies and mammals. Further this developed area can act as recreational, educational and interpretation center for the community of the corporate sector to understand and enhance their knowledge base on local environmental and ecological scenario.

Adani Foundation, Mundra-Kutchh proposed a biodiversity park at 5 acres Nandi Sarovar area and approached to Sahjeevan, Bhuj for technical support for same. Sahjeevan team visited this proposed site for development of greenbelt to support biodiversity and enhancement of overall ecological food web existing in and around the landscape in first phase.

In addition, senior team of Adani Foundation and Sahjeevan also discussed in details for this program and suggested to initiate an interpretation center for awareness to various stakeholders on very unique biodiversity of Kutchh region in second phase.

Zone wise different habitats identified by technical team, i.e. Outside Plot Area, Along Waterlogged Area, Climber/Twiner Area, New Plantation Area, Entry Gap Filing Area, Gate Area, and Wetland Area within the proposed project area, technical team will develop a list of species that are representative of mature, undisturbed local forests, grasslands and wetlands. The chosen species will be typical of the species composition of local habitats.

Develop a list of plant species that can be chosen on the basis of aesthetic characteristics, in particular for the beauty/abundance of their flowers, eventually of their fruits/foliage.

Define information on different types activities involved under this ecological greenbelt development project (i.e. butterflies areas, medicinal plants areas, birds areas etc.).

Develop a manual that will give guidelines for habitats based on local practices, for short term and long-term management.

Jiv Srishti Saurakshan Yojana (SDG 15/15.9)

Coastal Bio Diversity Park – Luni

In the coastal environment mangroves and mudflats are dynamic ecosystems that usually support a large population of floral and faunal life forms. Mangrove forests are highly productive ecosystems, which provide numerous goods and services both to the marine environment and people. Mangroves in India are spread over nine maritime states and three Union Territories. Gujarat has the longest (1,650 km) coastline among the maritime states of the country. With the second largest mangrove cover in India after West Bengal, Gujarat's mangrove area has increased from 1,140 km^2 in 2017 to 1,177 km^2 now.

A major portion of human population of Gujarat is solely dependent on these coastal ecosystems for their livelihood. Thus, several mangrove restoration programmes/ activities are in progress in the state. Mangrove restoration activities in Gujarat are mostly single species stands of *Avicennia marina*. Adani Foundation at Mundra-Kachchh has initiated multi-species plantation of mangroves in Kachchh in association with GUIDE. During 2018-2019 (Phase-I) multi-species mangrove plantation was carried out in 10 ha, during Phase-II (2019-2020) it was 02 ha and during Phase III (2020-2021) it is 01 ha. Due to geological set up of Kachchh where fresh water source is atypical, the survival and growth of mangrove plantation remains poor. Thus, a survival rate of 30% is expected for this multi-species plantation. Mangrove biodiversity park of its kind will help in disseminating knowledge on mangrove ecosystem and simultaneously conserving the species.

Since, some of the mangrove species are not readily available in Kachchh, their seeds/ propagules were procured from other districts of Gujarat and other states. The proposed species of mangroves that have the potential for enhancing mangrove biodiversity in and around APSEZL include *Rhizophora mucronata*, *Ceriops tagal*, *Ceriops decandra*, *Rhizophora apiculata and Aegiceros corniculatum*.

Vision

Enhance the diversity of mangrove and its associated species in suitable coastal region of Kachchh, which in turn increase the faunal diversity and fishery resources of the area by providing suitable habitats and breeding ground. The ultimate aim of the project is to improve overall coastal biodiversity of the region.

Mission

- Reconnaissance and identification of potential sites for technical suitability for enhancing mangrove biodiversity in Kutchh.
- Examine tidal pattern, availability and duration of fresh water, water regime/inundation, and substratum and water quality, species association at the site (based on secondary literature).
- Development of different plots based on combinations of species and site characteristics.
- Nursery development, transplantation of nursery grown seeds / propagules, monitoring its survival, etc.
- Examine the physico-chemical characteristics of water and sediment in the selected plantation sites.
- To detailed out the diversity, species richness of marine faunal component in the selected plantation sites
- To assess natural (algal encrustation, shift in substrate nature) as well as anthropogenic threats (cattle grazing, lopping) to the plantation site and provide suggestive measures.
- Long term monitoring plan and protection of the developed mangrove patches and coastal biodiversity in the plantation sites.

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Sea Weed Culture

Primary Information About Sea Weed

Recently, seaweeds have gained substantial traction globally owing to the appreciation of the benefits that they provide in societal, economic and environmental realms. Ever since the economic and ecological benefits of seaweeds recognised, there has been a constant and sustained global effort to further increase their production and utilisation by following innovative practices along the various value chains. Seaweeds are farmed commercially in several Asian countries where their utilisation for food and phycocolloids (agar, carrageenan and alginate) is intense, and their farming has indeed evolved into a social enterprise particularly in some Asian and tropical countries in the world. Seaweed farming has indeed emerged as an economic growth engine in several developing economies in Asia.

Adani Foundation Kutch

Utilization in India

In India so far, seaweed resources have been utilized exclusively for the production of typical phycocolloids such as agar and alginates by local processing units (about 30 MSMEs) from the wild harvest, particularly from the coast of Tamil Nadu. Despite developing pioneering technologies in both farming and processing for different economically important seaweeds, seaweed cultivation has not gained momentum and widespread in the country as expected but rather continued to confine to limited geographical regions in the state of Tamil Nadu alone. This could be partly due to different inherent challenges associated with open sea cultivation. The seaweed farming in the open sea is interrupted by monsoon and hampers the year-round production efforts and sustainability. With this backdrop, and further to give traction to the seaweed industry in the country, a unique consortium of industry partners have come together on a common platform with a unified interest to build a technologically competitive and viable platform for the production and processing of the seaweed feedstock for harnessing the associated economic and ecological (climate reversal and prevention of coastal water eutrophication) benefits to the fullest extent possible while providing livelihoods to the coastal communities, in the spirit of creating and sustaining “Blue Economy” as also “Inclusive Economy/Circular Economy”

Sea Weed Culture

Vision

The consortium aims to take a holistic view of transforming seaweed resources as natural capital and use open source knowledge to build an innovative technology platform for harnessing the economic potentials along with the associated ecological benefits thereof. Also, foster a cordial relationship with visionary sponsors and collaborators from India and abroad for sustainable production and utilisation of seaweed resources for the production of innovative products while engaging the coastal communities as direct beneficiaries (human capital) of this unique effort.

Collabration

Agrocel, Piddilite, Adani Foundation has jointly initited the Pilot Project with a objective transform sew weed into Natual Capital as well as engaging community as a human capital.

Achievements

A pilot cultivation facility (5 KL tanks in 6 nos) for the farming of different economically important seaweeds in the tanks on the onshore has been established and commenced the cultivation trials with red seaweeds *Kappaphycus alvarezii*, *Gracilaria dura* and green seaweed *Ulva*. The initial trials have given very promising results and harvested 6-7 times the seeded material in a 40-45 days cultivation period.

The successful completion of pilot cultivation trials of Kappaphycus has helped to move forward to set up raceway type tanks of 26 m Length × 6 m Width × 1.1 m Height in 2 nos for large scale cultivation of *Kappaphycus* in Balavadi campus at Juna Bandar, Mundra. The cultivation trials are in progress.

Growth of Kappaphycus in various durations

Sea Weed Culture

Further plan for Adani Foundation Mundra

The initial seaweed cultivation findings have provided enough evidence for upscaling the facility over a one-hectare area in 2021-22 engaging the local fishers who can earn reasonable monthly income by formation of Group of Fisherman.

Fisherman Group is initially consist of 15 members. Adani Foundation will provide off shore and on shore cultivation of sea weed, its further process i.e. cleaning and drying and expolore market opportunities.

In recent times, two outreach programmes were also conducted for fishers living in the Juna Bandar area to ascertain their interest in adopting seaweed cultivation as an alternate profession to fishing which is fastly dwindling. There is a scope for providing an additional income stream through seaweed farming to fishers if we set up model demonstration farms. These farms can be utilised for showcasing the cultivation technology, training purpose and seed supply for those fishers who likely to become seaweed entrepreneurs.

Raceway tank with Kappaphycus seaweed

Drip Irrigation Project (SDG 2/2.4)

- **Basis of Requirements of Drip Irrigation**

The main source of livelihood being agriculture, the cultivators tend to use more and more underground water for irrigation. Underground waters have gone very highly saline. The use of such water for irrigation has made the soil also saline and the crop yields have dwindled.

- **Process of Drip Support**

Farmer have to applied in the prescribed form of Adani foundation with photograph.
Inspection and verification will be by AF representative.
Ration card, work order of G.G.R.C, 7/12 certificate and all bills must be attached.
Farmer will be informed by telephonic to have form query.
Primary information about farmer land will be received by telephone.
Farm visit within 10 days of after received of application and verified the installation of system as per map and material as per bill will be checked and get farmer feed back.
Verification report submitted to account office.
Payment within 20 days if all document is complete through net banking.
Farmer economic study after our support. – Follow up

- **We have covered 295 farmers and 1422 acre drip irrigation area in last two years which is remarkable for water conservation in first phase – in this phase we have covered 66 farmers and 360 Acre land for the same.**
- **Total 968 Farmers and 5626 Acre Drip since 2011-12 to 2020-21.**

Sustainable Livelihood Development

In the villages at Mundra Taluka, several communities are economically side-lined and weaker that 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.

Work till date for Fisherman Development

444 Book Support

733 Vehicle transportation from Bandar to AVMB

86 Cycle Support

481 Scholarship Support

28015 Potable water provision

370 Youth Employment

2561 Fishing Net & Equipment Support

195 Linkages with Fisheries Scheme

3504 Ramaotsav Community Engagement

17 Fisherman Sea Weed Culture.

46878 Man days Mangroves Plantation

Fisher Folk Education (SDG 4/4.2)

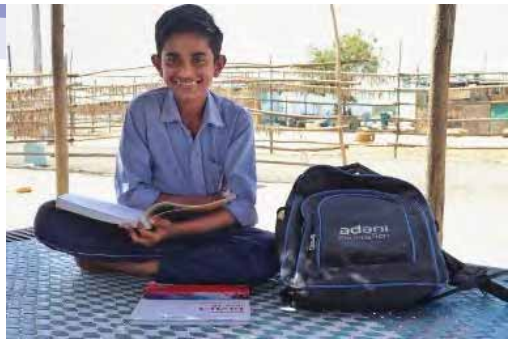
Fisher folk are having less illiteracy level so they are not motivating their ward education, Children are engaged in fishing practices since child hood ,which pushed them in terribly poor scenario in every aspect of life. Hence Adani foundation have started education program in dynamic manner to cover each segment of life from the Balwadi to Higher education study through various Intervention.

Scholarship Support Scholarship Support is a programme to motivate fishermen students for High school and secondary education . Girl child is supported with 100% scholarship to girls & 80 % support to Male Students.
Total 59 students were facilitated with scholarship current year

Fishermen Balwadi Education system were ceased in the covid-era. But with telephonic talk and home visit were continue since May 2020 with child & parents to keep them update for education, lesion revision and Covid awareness.

Vehicle transportation- Avail easy and safe transportation service for the Fisherfolk child of Various Vasahat to made them Regular and Synchronized with School atmosphere. Total 37 students from 6 to 10 standard are Benefitted.

Fisher Folk Education (SDG 4/4.2)



Book Support-
55 Higher secondary (9 to 12 standards) students were benefited with Books material from Juna Bandar, Zarpara, Luni, Navinal , Bhadreshwar Villages.

Cycle Support
Cycle support to Juna Bandar 9TH standard fisherfolk students to continue their study and Up down who are studying in Mundra Government School . This year 5 students were supported for the same

Ramaotsav
Ramaotsav Program was held at all fishermen vasahat for child motivation and aware parents for their ward education. This year total 442 students(1 to 10th standard) had participated in various outdoor game. Winner were felicitated with prize and others are appreciated with School bags.

Machhimar Ajivika Uparjan Yojana (SDG 14/14.B)

Fishermen are too vulnerable and marginalised community. Moreover due to uncertainty of fish catch and Four month Fishing band season they have to face vicious debt cycle. Adani Foundation with Gujrat Fisheries Board are providing Fishing equipment support as per Government Schemes.
Also AF has started various intervention for their alternate Livelihood and Employment.

Net & Equipment Support

Seven Fishermen are supported for Net and Equipment
10 Fishermen Linkage with Fisheries Department Scheme and Fishermen credit card for bankable loan

Mangrove Plantation

It is a win-win situation which provide 4830 Men days employment over 236 fishermen as well as created Environment sustainability as well.

Soft skilled & Technical training

Survey had been carried out in APSEZ Companies to Know human resource requirement And According that Fisher Youth youth were trained and interviewed for the Placement.
Total 70 Fishermen youth are selected and working in Various company current year.

Natural Farming Promotion

Soil is the key point for successful Agri-farming, it is the Millions of microorganism habitat which keeps an alive media for agricultural purposes, with improving water holding capacity, infiltration rainfall water rate, with improves plants ability to take soil nutrients which reflect on farmers Yield and returns. But the Imprudent & over use of chemical fertilizers & Pesticides deteriorate soil & Plant condition which made the ill effect on consumer health and farmer Livelihood .The permanent and cheapest solution to overcome the dangerous effects of modem agriculture to develop a farming system is to do natural farming which is economically productive and long lasting with various integrated and judicious method and management technique which play important role to maintaining or improving soil , plant health and farmers socio economic status.

Objectives

- Maximize biological activity in soil and minimize soil erosion.
- Enhance the genetic and biological system and its surroundings.
- Provide livestock with optimal living conditioned for wellbeing and better health.
- Promotion of environmentally friendly use of soil, water and air thus minimizing agricultural pollution.
- To improve the physical and biological properties of soils, self-life and flavor of farm Produce
- To reduce the use of inorganic fertilizers and pesticides.
- To convert Farm waste Biomass into renewable energy & rich Fertilizer. To increase export of farm produce

Implementation

A village level capacity building programs are organized for the farmers as awareness campaign and farmers are trained to adopt & implement Model farm initiative into their own farm. This Project will be implemented on cluster approach basis mean each cluster will have five to six model which will be used as demonstration and farmer to farmer training to adopt and replicate in their own farm.

Model Farming : Parameters

Sr. No	Activity Name	Objective
1	Soil Health Analysis	To Provide require Micro nutrient and improvement of soil quality
2	Cow Urine Collection	To prepare Jeeva Mrut, Gau Krupa Amritam Bacteria and Panchgavya
3	Cow base Farming	To use as liquid fertilizer
4	Home Bio Gas	Source of Renewable from Farm waste
5	RRWHS	To use of natural resource (rain water) to made independent Water sustain family.
6	Kitchen Garden	Ensure inexpensive ,regular and handy supply of fresh and healthy vegetables
7	Herbals crop farming	To avail herbal medicines at Home.
8	NB-21	To create individually fodder sustainability.
9	Farm Banding	To reduce soil erosion and retained moisture in the soil.
10	Bore well & well recharge	Enhance the ground water level.
11	Drip Irrigation	To save ground water & reduce salinity ingress.
12	Fruits Crop farming (seasonal)	To Fetch high yield and returns perennial
13	Compost Fertilizer	To act As conditioning soil with increase the Nutrients and water holding capacity.
14	Wormy Compost	Increase porosity and microbial activity in soil to improve water retention and aeration.
15	Training Otlo (Farmer to Farmer)	To deliver TRAINING IN FORMAL & Informal way.
16	Jiva Mrut	As source of Natural Fertilizer and micro nutrients to healthy crop and yield.
17	Vegetable Fertilizer	To create healthy soil condtion.
18	Mulching	To create microclimate around plants root to create healthy environment for plant growth.
19	Chaft Cutter	To made easy for cattle chewable & digestion.
20	Modern Agri Tools	To have great benefit in production
21	Nursary development	To avail local plants & seed.
22	Intern Crop	To produce greater yield in limited resources.
23	Mix Farming	
24	Government Scheme Linkage	
25	Dates Tissue & Offsuit Plantation	To produce uniform date fruits in the siza shape and taste.
26	Linkage with KKPC	To become share holder and hence partners with natural farming promotion

Promotion of Natural Farming –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.
Under Gram Utthan Project, Adani Foundation is supporting home biogas to farmers to Uthhan Villages phase wise.
Current year supported 117 home biogas in Dhrub, Zarpara and Navinal Villages.

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

Adani Foundation Kutch

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

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.

Earlier we had proceeded for capacity 2 cum but after visit and series of meetings with farmer group – we need to take up plant capacity 6 cum

Till date 117 farmers are utilizing it with satisfaction and considerable outcome by saving Average Rs. 23,400 for gas and fertilizer as well.

Benefits of Home biogas

Plants without bio slurry:

Plants with bio slurry:

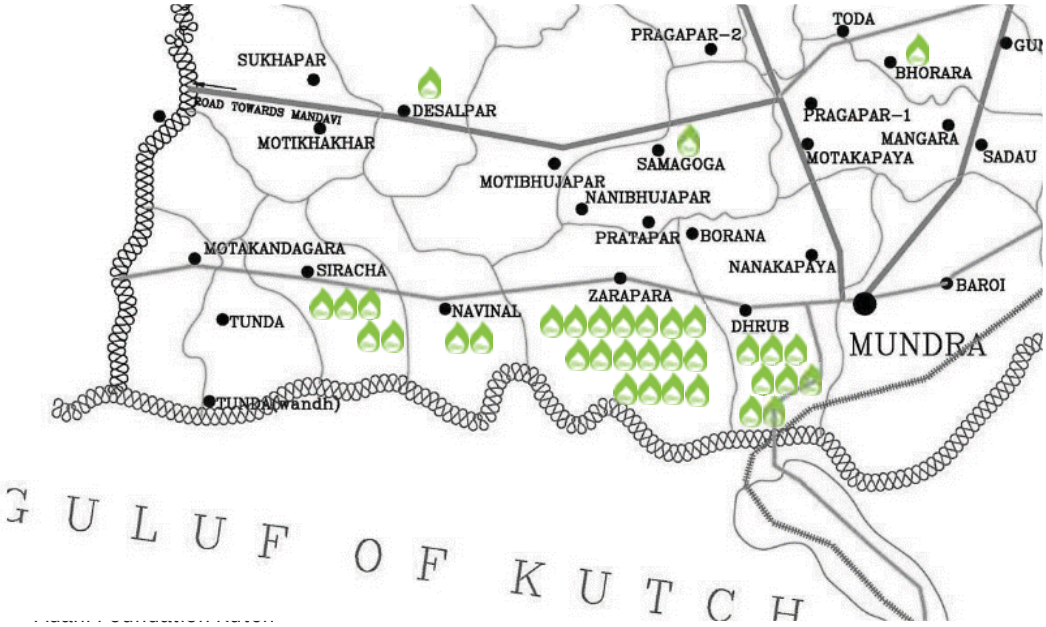
Difference between plant growth

Before home biogas

After home biogas

Usages of biogas in villages of Mundra block

Selection of village by some important parameters i.e. Mobile Van data of lungs related issues, Ambient air quality, cattle population, agriculture land availability, willingness for natural farming
Selection of beneficiary base on willingness of Natural Farming and Number of Cattle. In this Project Primary Stakeholders are also partnering project by financial contribution as well.



Biogas – 117 Nos

82	- Zarpara
18	- Dhrub
07	- Siracha
03	- Navinal
07	- Other

Dragon Fruit Farming (SDG 2/2.4)

Dragon fruit is a tropical fruit that has become increasingly popular in recent years. Though people primarily enjoy it for its unique look and taste, evidence suggests it may provide health benefits as well.

Dragon fruit grows on the *Hylocereus* cactus, also known as the Honolulu queen, whose flowers only open at night. The two most common types have bright red skin with green scales that resemble a dragon — hence the name.
The most widely available variety has white pulp with black seeds, though a less common type with red pulp and black seeds exists as well. In Kutchh Red variety is available due to its weather condition and soil type.

Dragon fruit contains small amounts of several nutrients. It's also a decent source of iron, magnesium, and fiber Dragon fruit contains several types of antioxidants These are compounds that protect your cells from unstable molecules called free radicals, which are linked to chronic diseases and aging

Due to all this benefits and suitable weather condition and soil type Adani Foundation has provided technical support and awareness training to start the dragon fruit farming. Five Dragon fruit farm have been developed with pole and Wire fencing support for 2 acre land and 1000 dragon fruit plants each. Adani Foundation had given 40% contribution in this Project. Fruiting will start from June 2021.

Tissue Culture (SDG 2/2.4)

Date palm (Phoenix dactylifera L.) is one of the oldest trees known to mankind. It is popularly referred as “Kalpavriksh of Kutchh” as it is an important fruit tree of arid and semi-arid regions of the State owing to its high tolerance to environmental stresses especially abiotic.

The biggest constraint faced for the improvement of date palm following conventional breeding approaches includes its long generation cycles. Nonconventional approaches like Marker Assisted Selection is not possible as there is no true breeding population and very trace molecular work has been carried out till date.

Due to its cross-pollinated nature, date seeds are highly heterogeneous and heterozygous which give rise to 50% unproductive male trees and 50% female trees with poor or varying productivity in terms of both yield and quality.

Date palm cultivation is the only means of livelihood for majority of farmers belonging to Kutchh region of the state. Looking to aforesaid limitations in applying traditional and non-traditional approaches, mass multiplication (Tissue Culture) of superior quality date palm is the need of time to increase the socio-economic status of the farmers and date growers

Advantage

Tissue culture plants bearing offshoots are true-to-type in nature and hence, in short duration a uniform population could be developed. Availability of planting material of Barahi genotypes round the year.

Selection of offshoots is carried out which are disease free, higher in yield and having good fruiting characteristics, hence export of fresh dates could be carried out by the farmers. Due to Large scale plantation of Barahi trees can be increased.

Dates is the nectar of the kutchh and Our periphery villages are known to produce exportable dates belt as having appropriate weather condition.

To increase the farmer income and over all production individual farmer We have provide “Barahi Varities Tissue plant” which has good strength and productivity.

850 plants have been distributed to 34 farmers. 25 plants / Farmers.

Tissue plant cost is 3000/ per cost with 50% famer Contribution. As per tracking record more than 97% plants are growing very well as per expectation.

Adani Foundation Kutch

Agri mall by Kutchh Kalptaru FPO

GOVERNMENT OF INDIA
MINISTRY OF CORPORATE AFFAIRS
Central Registration Centre

Certificate of Incorporation

DEPUTY REGISTRAR OF COMPANIES
Central Registration Centre

Kutchh Kalptaru producer company is a registered FPO by central registration center has Started Agro cum Women empowerment Mall at Shantivan complex Nana-kapaya Mundra with support of AF to provide platform for farmers and SHG women to fetch the right value of their products.

The Grand Inauguration of Agri Mall was done on 26th October in presence of Mr.K.G Chaudhary (Sub District Magistrate Mundra) and Mr. Joshi Director (District Rural Development Authority, Kutchh) and Mr. Rakshit Shah EDM, APSEZ.

Currently more than 170 types of items i.e. Chemical free Grain, pulses, sugar, Jaggery, oil, masala, Vegetables ,dry Snacks made by women group, handicraft items, Mud Utensils, toys, handmade chocolates and many more are placed for sell.

Under the Umbrella of Kutchh Kalptaru farmers producer company more than 200 Farmers and 112 women been engaged. KKPC Agri –cum Women Empowerment mall Approx. Rs.4.07 lacs turn over till end Feb (for 6 months)

Animal Husbandry-SLD (SDG 2/2.5)

The less rainfall and high saline ground water kept agriculture practices in threaten situation. Adani foundation have started various intervention for the Holistic development of Agriculture and Animal Husbandry

Fodder support

In 20 villages of Mundra and Anjar Block. 6.70 lacs kg Dry Fodder and 11.60 lacs kg Green fodder has been supported.
95 Farmers benefitted with NB -20 Off suite to bring fodder sustainability.
125 farmers are supported with 40KG maize per farmer with Micronutrient for **Individual Fodder Cultivation** during winter Season.

Sr. No	Village Name	No of Farmers	Average Production	Average rate	Average Value
1	Zarpara	64	4562.26	2.5	7,29,961
2	Navinal	23	3973.91	2.5	2,28,499
3	Siracha	35	3910.28	2.5	3,42,149
4	Desalpar	3	3733.33	2.5	27,999

Fodder Cultivation

Village Gauchar land development for the fodder cultivation to made fodder sustain village & Avail green fodder in scarcity phase.
With the support of Gauchar Seva Samiti Grass land development in Siracha-85 Acre & Zarpara -25 Acre done which resulted in total production 82 ton.

Animal Husbandry-SLD (SDG 2/2.5)

Bovine brucellosis

Bovine brucellosis is chronic factious cattle disease that causes abortion, dead & weak birth of calves, and infertility which reduced milk production and ill effect on health as well. Cattle and buffaloes are susceptible and persist for many years. It's a zoonotic disease (that can be transmitted from animals to people)

Brucellosis disease Control and management project has been started in our 11 Villages with (**National Dairy Development Board and KFFFDC(Kutch fodder fruit & forest development trust)** is ongoing with awareness & vaccination to (0 to 3 yrs female cattle).

Total 2132 Cattles have been vaccinated

Under this project following activities were carried out so far,

- Meeting with Gram Panchyat, 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 Panchyats
- Primary Survey and Sample Collections i.e. Milk Ring Test, Blood Collection and testing
- Brucella Vaccination and Ear Tagging etc.
- Expense per Animal = Rs. 177 / Cattle – including awareness and vaccination

Women Empowerment (SDG 5/5.4)

Today entire world is nothing against the corona pandemic ...not only India but all the nations world wide are striving hard to fight against this and come out of it at earliest . The situation lies in invisibility and severity of the causative agent . It is generally observed that the newly discover diseases are such which could be avoided by being more cautions.

Adani foundation works hard for upliftment of women, it has noteworthy history of completing and executing projects addressing issues like educations, health and empowerment from grass root level in Kutch district many project are done for females by various organizations but there are certain issue specially pertaining to women 's health which are still remaining unaddressed due to the social stigma and hesitations issues' like usage and importance of sanitary pad during menstrual cycle to protect oneself from fatal disease . This simple precautions can also help a female to fight against cervical cancers like disease as well. Keeping this thought in 8th March 2020 Adani foundation held a seminar on awareness during menstrual cycle -Myth and facts . The seminar witnessed 300-400 Participants including women college going girl ,homemakers etc.. This initiatives helped the females to voice out their quarries and problems and to get a solutions for the unusual problems. District Development officer was the part of the seminar.

District development officre of kutch shri Prabhav Joshi was highly impressed with the task been undertaken for women empowerment and the motivated for production of sanitary pads to the women of adani foundation . This task was vey planned and executed by the enthusiastic women group – it was a great journey towards success"

Initially the works seemed toughed as the outcome /day was 150-200 pads with minimum profits . Bit real salute this women that they did nit lose hope and tirelessly kept working for this mission . It is rightly said "practice make a men perfect and the graph of producing the pads per day rose from 300 to 350 and further elevated to 400 to 500 by proper distribution of work with strict target . Simultaneously the order started pouring in from District were satisfactorily completed . Today each woman is earning average 2900 Rupees /Month ,expansion of thus task is being planned by Marketing it to every small and making it a sustainable model which may be a benchmark in itself.

The spirit hard work and motivations of these women have given a way to increase in demand from district development office ,PHC,CHC office Aganvadi and even out of state orders will be very soon catered to.

This is an example showcasing how women empowering can bring about development of as small scale task to a full- fledged Endeavour.

Women Empowerment (SDG 5/5.4)

Empowered women and girls contribute to the health and productivity of their families, communities, and countries, creating a ripple effect that benefits everyone.
An initiative under the Sustainable Livelihoods Development Program to encourage women, sense of self-worth, decision-making power, access to opportunities and resources, power and control over her own life ability to be effect change.

11 SGH Group have been engaged with 127 Women

Saheli Swa Sahay Juth are trained for Sanitary pad preparation anmd and supported with semi Automatic sanitary pad making unit. In the year of 20-21 total turn over was Rs.3.12 Lacs

Self Help Groups

Adhar Saheli Swa Sahay Juth is engaged making dry nasta preparation got Fssai Certificate in current March which will help to market the products

Sonal Saheli Swa Sahay Juth is engaged in Phynale & Washing powder making its Current year turn over was Rs.4.50 Lacs

Tejasvi Saheli Swa Sahay Juth- is expert in Stitching practices & made approx. Ninty thousand Three layer mask which had generate Rs.9.45 lacs revenue over 10 Women.

Sr. No.	Name of Group	Village	Skilled	Member	Total saving (In Rs)
1	Sonal Saheli Swa Sahay Juth	Shekhadiya	Phynale & Washing Powder	11	1,32,500
2	Jay Adhar Saheli Swa Sahay Juth	Baroi	Dry Snake	10	84,000
3	Tejasvi Saheli Swa Sahay Juth	Mundra	Stiching,Uniform,Bag	14	84,000
4	Umang Saheli Swa Sahay Juth	Mundra	Soft toyes, Jula,	11	84,000
5	Vishvas Saheli Swa Sahay Juth	Navinal	Tie & Die, Stiching	11	84,000
6	Jay Momay Saheli Swa Sahay Juth	Kandagara	Tie & Die, Stiching	10	84,000
7	Meghadhanush Saheli Swa Sahay Juth	Mudara	Mud Works,	10	84,000
8	Saheli Swa Sahay Juth	Mundara	Sanitary Ped	11	84,000
9	Radhe Saheli Swa Sahay Juth	Zarapara	Dhadaki, Small Godadi	14	84,000
10	Shrddha Saheli Swa Sahay Juth	Mota Kapaya	Snacks,Thepala,Vada Pav	15	84,000
11	Mogal Saheli Swa Sahay Juth	Shekhadiya	Roti,Ladu (Churama)	10	84,000
Total				127	9,72,500

Community Infrastructure Development (SDG 9,6)

Community infrastructure development includes both public and privately provided facilities and services required to accommodate and support community services, programs, activities, which is significant to improve their quality of life & Productivity. Adani foundation designed and build various structure and provide service in the Health ,Education, agriculture and sustainable livelihood area.

Community Infrastructure Development (SDG 9,6)

To store rainfall water and increse water level, Pond Bund strengthening work had been carried out at Zarpara Village
apart from this various activity like approach Road Restoration at All Fisherfolk Vasahat, Bus Stand with wall Construction, Open Shed Sukhpurvah Mundra, Shelter at Randh Bandar , Garden Development Primary School Rampar village has been done in this year.

Bund strengthening work at Zarpara

Approach Road Restoration at All Fisher folk Vasahat

Garden Development Primary School Rampar village

Open Shed Sukhpurvah Mundra

Adani Foundation Kutch

SuPoshan (SDG 3/3.8)

The objective of the Project is to reduce occurrence of malnutrition and anemia. create awareness about malnutrition and anemia and related factors amongst all stakeholders and role they may play in curbing the issue.

To successful implementation of the project, “Sangini – Village Health Volunteer” plays major role in the Project. The purpose of the Project is to reduce occurrence of malnutrition and anemia. create awareness about malnutrition and anemia and related factors amongst all stakeholders and role they may play in curbing the issue.

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As per Global Nutrition Report, Children below five years- 23 % Stunted and 8 % are wasted. 69.5 % children 6-59 months old, 55.8% adolescent girls aged 15-18 years, 55.3% women aged 15-49 years have Anaemia. Moreover anaemia prevalence in pregnant women is as high as 58.7 %) Curbing Malnutrition was part of Millennium Development Goals and again focussed through second and third Sustainable Development Goals on Zero hunger and Good Health & Wellbeing respectively.

During the year various activity like, Covid-19 awareness in village & Slum Area, Menstrual Hygiene Day, Breastfeeding Week, National Deworming Day, National Nutrition Month had been celebrated.

With slogan of "RED-ACHHA HAI" - 100 beneficiaries in Menstrual Hygiene Day, 204 beneficiaries in Breastfeeding Week, 320 beneficiaries in National Deworming Day, 20 villages covered in celebration of NATIONAL NUTRITION MONTH and 42 Family counselling had been done.

Community Engagement and other Activities		
Sr.No	Activity	Total
1	No of Sangini	24
2	Total Village Cover	41
3	Total Anganwadi Cover	70
4	SAM to MAM Monitoring Progress	03
5	MAM to Normal Monitoring Progress	15
6	Focus Group Discussion	85
7	Family Based Counselling	42
8	Village level Events	05
9	No of SAM children referred to CMTC	06
10	Total Anthropometric screening	140
11	Total Family Cover through video & Audio Calling	20
12	Total House Hold Family Visit	130
13	No. of Severe Acute Malnourished children (SAM) Telephonic Counselling	08
14	No. of Severe Underweight children (SUW) Telephonic Counselling	03
15	No. of adolescent girls-Telephonic Counselling	190
16	No. of pregnant women-Telephonic Counselling	100
17	No. of lactating mothers-Telephonic Counselling	230
18	No IFA Tablet Distribution to adolescent girls	200
19	Total Family Cover	9178
20	No of Sangini completed online POSHAN Abhiyan E- Learning module	15

THANKS GIVING PROGRAMME" MUNDRA & BITTA Site

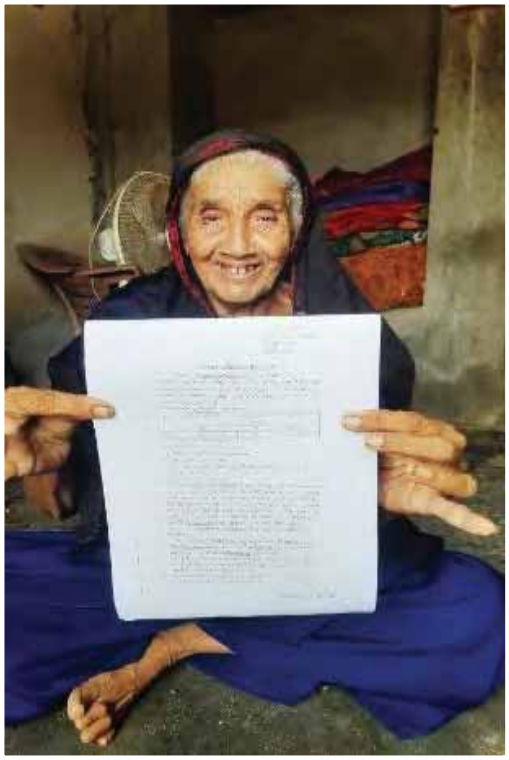
SuPoshan Thanksgiving program was organized. In this webinar DDO, CDPO Mundra and other dignitiaries remained present and appreciated the efforts to overcome malnourishment in Mundra and Bitta.

Community Resource Center (SDG 3)

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

- ✓ Listed out the Widow ,Senior Citizens ,Handicapped & Orphan Child from seven Utthan villages and linkages accordingly with the Social Defense Department Scheme,. 276 people are Facilitated in coordination with Bhuj Samaj Suraksha Khata.
- ✓ With a slogan "Beti Bachavo – Beti Padhavo" to ensure better future for Girl child education by Linking 1001 Girl child with Government "Sukanya Samrudhhi Yojna" & Vahali Dikri Yojna.
- ✓ 48 SC Farmers were Linked Kitchen Garden Scheme.
- ✓ To avail Fishermen Government scheme (Fishermen Credit card) one day program was arranged with social distancing and all precaution.
- ✓ 30 KCC form fill-up at Navinal. Created awareness with Telephonic about same

Project Swavlamban



Project Swavlamban Launched for linkages of differently abled people of Kutchh District to Social Welfare Department. Foundation is playing supporting role to increase awareness and tie up with Government schemes for Divyang people, widows and senior citizens and coordinate them with Social Welfare Department.

The identity cards - UDID 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.

After getting income generation equipment support - Proper training provision is given to make them self-reliant in true sense!!

Till date Total 1057 beneficiaries have been linked up with various government schemes and 519 beneficiaries have been supported through various schemes of income generation.

Project Swavlamban

Total 1576 beneficiaries have been benefited and get support of Rs.24,12,550/- through Government and Adani Foundation.

No	Government Schemes	Beneficiaries	Per / Month	Total Amount
1	Widow women	237	1250	296250
2	Senior citizen	94	750	70500
3	Sankat Mochan (One Time)	2	40000	40000
4	Widows Ration card Renewal	13	0	0
5	Diviyang Pension Scheme	5	1000	5000
7	Palak Mata Pita Pension	9	3000	27000
	Total	360	-	438750

Government Scheme	Beneficiaries	Amount	Total Amount
Artificially foots	14	15000	210000
Artificially Hand	1	5000	5000
Blind satick	7	200	1400
Bycycle	9	4500	40500
Crutches	4	200	800
Hand cart	4	5000	20000
Hearing Aid	13	3000	39000
M.R kit	20	500	10000
music	1	500	500
RTE Admission	1		0
Sewing Machine	30	5000	150000
Tricycle	43	6500	279500
Walker	3	1000	3000
walking satick	12	200	2400
Wheelchair	33	4000	132000
Bus pass	427		0
Rasion card renew	13		0
Medical certi	422		0
Total	1057		894100

Divyang AF Support			
Details	Beneficiaries	Amount	Total Amount
Cabin	6	15000	90000
Fridge	1	18000	18000
Fruit Shop	2	8000	16000
Grocery Shop Item	5	5000	25000
Hand Cart	3	9000	27000
Harmonium	1	10000	10000
Rikshaw	1	80000	80000
Sewing Machine	27	5500	148500
Tricycle	44	6800	299200
Wheelchair	60	4000	240000
Lims	9	14000	126000
Total	159		1079700

Adani Skill Development Centre

India has highest population of the youth yet there has always been a major issue of increasing unemployment on one side and non-availability of skilled professionals for industries.

Adani Group has initiated Adani Skill Development Center model with broad and long term vision to enhance employability of youth and getting right people at the right place of skilled requirement.

Adani Skill Development Centre (ASDC) is playing a pivotal role in implementing sustainable development in the state. ASDC is envisioned to be playing a major role in elevating the socio-economic status of the people belonging to the lowest strata of the society by empowering them with various skill development training for employability and livelihood.

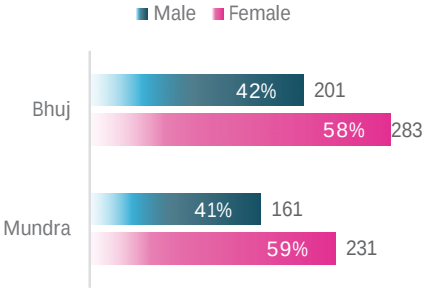
Over the last few years, ASDC has assessed various aspects of the technical, leadership. and soft skills gaps that organizations, in general, face and accordingly. focuses on imparting required training in those areas in partnership with various colleges and institutes.

Several miscellaneous industries exist in Kutch district. Adani Skill Development Centre has started a center in Mundra and Bhuj block so that the needs of these industries are fulfilled.

Admission for the F.Y. of 2020-21

Bhuj

	General Duty Assistant	Basic Functional English	Digital Literacy	Entrepreneurship Skills	Financial Literacy	Mud Work	GST with Tally
Free Training Model	0	185	25	0	0	0	40
Paid Training Model	140	3	47	1	2	4	18
Kachchh University	0	0	2	0	5	0	12



Mundra

	Basic Functional English	Basic Home Health Care	Beauty Therapist	Business Training (MS-Office)	Digital Literacy	Financial Literacy	General Duty Assistant	Marketing Skill	Mud Work	Non Domain Skills	GST with Tally	Training Skill
Free Training Model	43	12	00	66	57	07	04	11	00	03	00	15
Paid Training Model	07	00	56	00	20	00	13	00	73	00	05	00

Placement Details

ASDC imparted various soft skilled and technical training to made Atma Nirbhar India.
Total 47 youth have been placed in various company and 37 youth are been self employed.

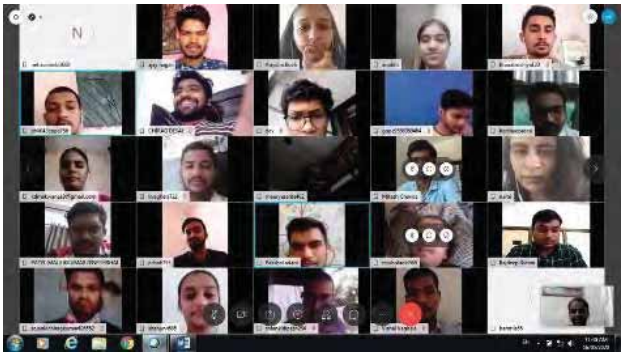
Bhuj

Trade	Total Trained
General Duty Assistant	51
Basic Functional English	79
Digital Literacy	61
Entrepreneurship Skills	1
Financial Literacy	2
Mud Work	4
GST with Tally	16
Total	**214**

Mundra

Trade	Total Trained
Basic Functional English	50
Basic Home Health Care	12
Beauty Therapist	52
Business Training (MS-Office)	66
Digital Literacy	77
Financial Literacy	7
General Duty Assistant	13
GST with TALLY	9
Marketing Skill	11
Mud Work	73
Non Domain Skills	3
Pedicurist and Manicurist	4
Training Skill	15
TOTAI	**392**

E-Learning Training at Bhuj



In this type of pandemic we have started virtually training on various trades like General Duty Assistant, Digital Literacy, GST with Tally, Basic Functional English etc. On Saksham Day we started E-learning training of Digital Literacy & Basic Functional English on free bases.
Till date we admitted 221 candidates in domain courses and 263 candidates in non-domain courses.
Now we started offline training with following all Covid-19 related guidelines.

The students of DDU-GKY (GDA) creating awareness regarding Covid-19 in their own village through various activity

Meeting at Palara Jail and after that meeting we did skill survey of around 150 prisoners.

MoU signing ceremony was arranged by **Krantiguru Shyamji Krishna Verma Kachchh University** on 11th January, 2021. In this project we will provide training in 4 courses (General Duty Assistant, Digital Literacy, GST with Tally & Financial Literacy).

MoU signing ceremony was arranged by **The Takshshila Educational & Charitable Trust - Bhuj** on 06th March, 2021. In this project we will provide training in 7 courses (Entrepreneurship skills, Non Domain employability skills, Diet & Nutrition, First aid, Digital Literacy, GST with Tally & Financial Literacy).

Arranged interview of DDU-GKY GDA students at Sterling Hospital – Gandhidham, GAIMS (Sodexo), Chanakya College, Accord Hospital, Fire Academy.
39 students get placement in GAIMS (sodexo), Alilance Hospital, Shreeji Hospital, Bhuj Fire Academy, Divine Hospital etc.
3 students are working in COVID-19 Hospital

online beauty therapist course has been conducted by ASDC Mundra

Online mudwork training has been organized by ASDC Mundra, after training 28 students became self employed.

Soft skill training for Fishermen youth & Industrial Employer meet

Organized industrial employer meet at Adani House with support by Adani foundation team. And conformed Vacancy details in respective Company. After that ASDC mundra team and Adani foundation jointly given 3 days soft skill training for Fisherman youth. The main objective of this training are to provide alternate livelihood to Fisherman community group specially those youth who are 10th -12th, ITI, diploma and graduates.

Adani Foundation Kutch

CSR Nakhatrana

Adani Green Energy(MP) (AGEMPL) set –up approx. 1250 windmill from Dayapar to Nakhtrana in Kutch (Gujarat). And as the part of our corporate social responsibility adani foundation have started various intervention for the holistic development of community since 2019 in the Ratalita , Amara, Deshalpar ,Jinjay, Dhamay & Ugedi Villages with Community Involvement by means Participatory Rural appraisal (PRA), and VDC (Unnati manch) formation to identified real need and extended our arm to render Education , Health , Livelihood and community infrastructure facilities.

Water through construction with 10 KL capacity in the barred land to avail drinking water for domestic catlle and wild animal at Ugedi & Deshkapar Villages.

Urinary Block Construction in the Ugedi village to keep Swachh Villages swachh and to provide privacy for women

Swachh Village Cleanliness is the beauty of village and to inculcate the habit to keep villages swachh and clean.100 Dustbin were provided to 8 Villages of Nakhtrana which are been kept at Public places and maintain and monitoring by GP

Sitting arrangement with Benches and tree plantation around the cricket ground of Kotda madh villag with tree Guard.

Uakdo distribution it is been said that Prevention is the better than care hence to mitigate the ill effect of covid-19 we organized Ayurvedic Kwadh & Immunity booster medicines distribution camp in the Nakhtrana city. And aware to take precautionary care.

Total 500 peole were benifitted with the same.

Event

- **World Environment Day** Celebration on 5th June **and Van Mahotsav week celebration** in Ugedi village with awareness and tree planation Program.
- **Women day celebration** on 8th march with Collaboration of ICDS Department in the Ugedi Village . On this occasion Elocution competition were held on the topic of women empowerment and women right among primary students and winner were felicitated with memento prize. More than 60 Women were remain present and motivated and Encouraged .
- **Tree Plantation** have been done in the Ratadiya and Deshalpar villages with tree guard with sensitization about the important of trees and responsibility for watering and caring of trees.

Lakhpat : Tree plantation with awareness at Kapurashi & Koriyani village of Lakhpat Taluka. Adani Foundation had also provided 150 cages.

CSR Nakhatrana

Setu

we are acting as the bridge between Beneficiaries and Government to facilitate government welfare scheme. due to this effort 82 widow women are getting widow pension of rs.1250 per month which is worth for them.

Sr. No	Scheme	Beneficiaries
1	Widow Pension	82
2	Bus pass	5
3	Wheel Cahir	2
4	Panchar Kit	1
Total		91

Swavlamban

Adani foundation provide tool & Kits support to Physically disable person the main objective of the program is to made them self sustain and “Atma Nirbhar” We are supporting various Tool & Kits to various Villages

Swavlamban Support To Disable Person								
Sr. No	Village Name	Sewing Machine	Cabin Shop	Flour Mill	Wheel chair	Trycycle	Hand Cart	Total
1	Dahmay	1						1
2	Aamara	4		1			1	6
3	Jinjay	2		1	1			4
4	Deshalpar	1	1					2
5	Ugedi	1	3		1	1	1	7
6	Ratadiya		3					3
Total		9	7	2	2	1	2	23

CSR Nakhtrana

Semi arid climate with very scanty rain fall does not support extensive and water intensive agriculture in the nakhtrana region .
more ever Farmer are not aware about modern agri technology adani foundation have started some intervention for the integrated agriculture development .

Kitchen Garden Kit
To promote the horticulture farming practices farmers are provided with Kitchen garden kit with twelve type if Vegetables , fertilizers and plastic carret.

Promote for Vegetable farming with structure support i.E Bamboo ,wire and cement Pole support to set up structure for vegetable support and grow.

Sr.	Village Name	Kitchen Garden Farmers	Vela Vala Farming
1	Ugedi	8	3
2	Ratadiya	8	
3	Aamara	7	
4	Deshalpar	10	2
5	Jinjay	7	
Total		**40**	**5**

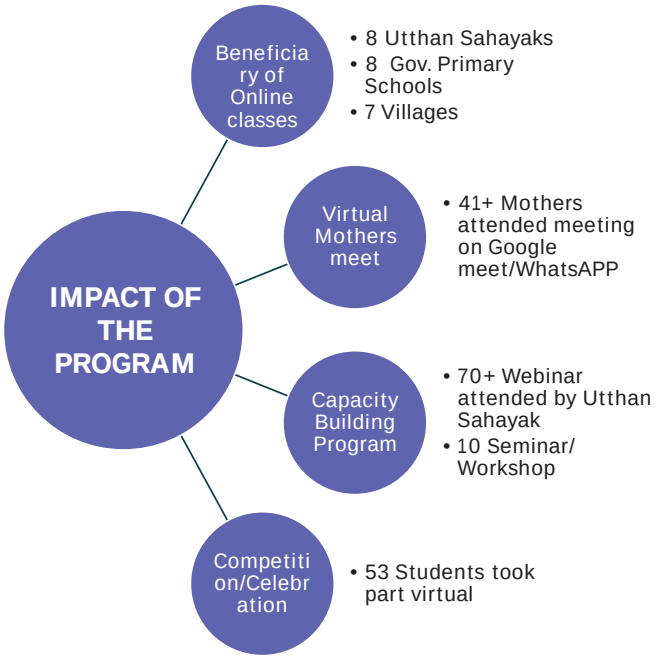
Organic Farming training
To aware about the ill Effect of pesticides and chemical fertilizer in farming and promote toward organic farming training was organized at Deshalpar with hand on training for Jivamrut preparation.Total 38 Farmers were participated

Modified Dev-6 wheat seed Distribution to two farmer of Deshalpar and Ugedi Village as demonstration which resulted that it produce High yield with less irrigation comparatively.

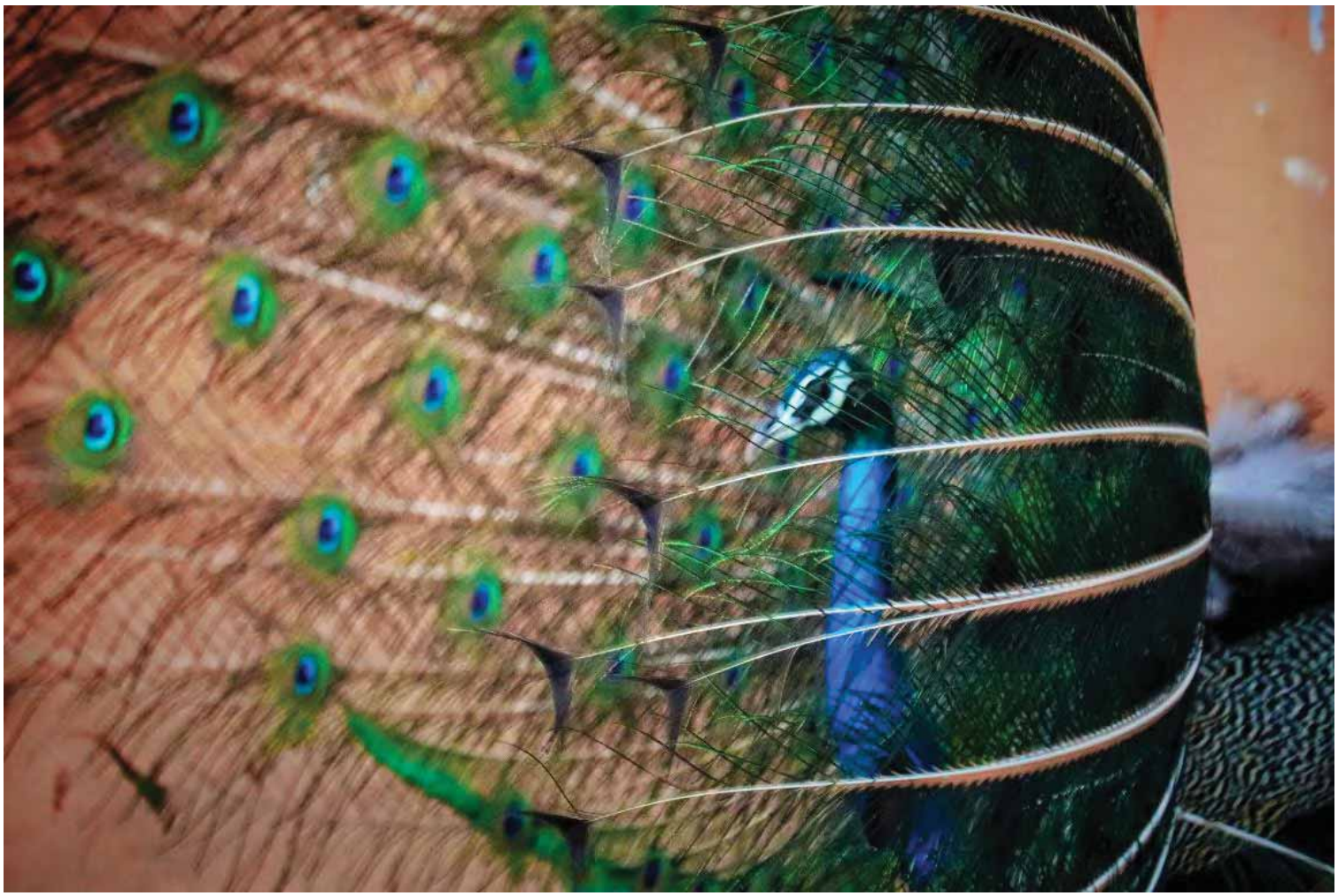
Adani Foundation Kutch

Utthan Nakhtrana

Large-scale efforts have been made by the government and non-government sectors, especially in rural government primary schools, but coverage and quality of education are still not satisfactory.
Adani Foundation leveraging their experience, to intervene in Government Schools. These interventions will aim to enhance the quality of primary education in Government schools.
Under Project UTTHAN 8 primary government schools of Nakhtrana Taluka of Kutch district have been adopted to take up various initiatives aimed to improving quality of education these schools.
Total 234 priya vidyarthis are benefiting from a meaningful education in these schools. .



Year	No's of School	No's of village	No's of Girl	No's of Boys	Total
2019-20	8	7	560	590	1150
2020-21	8	7	593	570	1163



CSR Nakhtrana

Environment and bio diversity conservation is always been the prime responsibility of adani Foundation. with this objective we started such work in Ugedi village near Nakhtrna to develop Ecological green belt to attract major faunal group such as amphibians, reptiles, birds ,butterflies and mammals and restoration of native vegetation to improve overall ecological food web of landscape.

This work has been entrusted to Sahajivan, an expert organization for the protection and conservation of biodiversity as part of which following work have been carried out.

- BMC –Bio diversity conservation committee has been formed in Ugedi Village.
- Habitation Improvement by removed "***PROSOPIS JULIFLORA"- Ganda Bavar*** from 8-10 hectare and native tress seed has been sprinkled As well as in the garden of Ugedi village and in the place of Angalwadi, trees have been planted.Also,in the seam land seam area of Ugedi village, more than 300 native trees have been planted like Desi baval *(Acacia nilotica*), Mithi Jar *(Salvadora oleoides),* Liyar *(Cordia sp.*) and Gugal *(Commiphora wightii)* Pilu, Khejari, have been planted.
- Improvement of Catchment : approx. 750 cubic meter excavation and embankment in sloping ground to increase catchment area of open pond to support existing Vegetation and other Biodiversity
- Three species **1. Bird - Peacock 2. reptile-Spiny tailed lizard 3. mammal-Chinkara** are selected for Conservation
- Started awareness program with pamphlet, Leaflet and IEC Material distribution in the Villages and School to sensitize about their important to maintain ecosystem and Bio diversity.

Adani Foundation Kutch

CSR Tuna

Adani Kandla Bulk Terminal Pvt. Ltd. is joint venture of Adani Ports and SEZ Limited as well as Kandla Port. There are three Villages & Two Fishermen Vasahat where Adani Foundation Doing various CSR activities in the Education, Health , SLD and Community Infrastructure area. Adani Foundation are running Rural Clinics in 3 villages on regular basis and supporting the villages in water storage and distribution networks. Current year supported for Drainage network for Tuna and Wandi as per MOU between Pandit Dindayal Trust and Adani Foundation

Adani Foundation Kutch

Drainage work

As per MOU between Dindayal Port Trust and Adani Founation – Contribtuion of Rs. 40 Lacs for Drainage Facility Provision in Tuna and Wandi Village was taken up and work will be completed upto June 2021

Water facility

To reduce water born disease, we are providing portable drinking water facility at Dhavalvaro bandar and Vira bandar.

Ration kit support

During covid -19 pandemic & lock down directly and adversely affect over Poor and vulnerable families whose are sustain daily wages work. We Distributed Ration kit to those people with aware to take precautionary measures as well. Total 1100 Ration Kits were distributed to Tuna Rampar and Vandi Villages

Tree plantation

Tree plantation has been carried out at Tuna, Vandi & Rampar village and Garden development work has been done at Rampar primary school which would create healthy environment and entertainment over students.

Fodder support

in Rampar and Tuna village 47950kg dry fodder and 335730kg fodder has been supported during this year.

Rural Clinics

Rural Clinics 2 hours per day are operated by Adani Foundation to ensure primary health at door step. Total OPD is @ 350 per month.

Adan

CSR Bitta

Under Adani Solar Limited – 40 MW Solar Panel Power Unit is Situated at Bitta Village in Abdasa Taluka. We have done various activity under the CSR work.

As Abdasa is water scared region with list amount of rain Fodder support had been provided to 100 ton fodder to Bitta, Dhrufi and Moti Dhrufi villages.

Cleanliness of village Pond inlet in the Bita Village which lead more storage capacity and Village. Pond bunding construction in Dhufi village.

Cricket ground of bitta village has been upgraded and cricket kit provided to youth.

Panchayat Building construction was carried out by Adani Foundation's support and technical guidance.

Drainage line maintenance and Cleanliness is frequently done in Bita which lead Swachh Village

EVP
Employee Volunteering program

Since last few years adani group employees are adopting students of migrant labours. this year also all the 802 students of Vallabh vidhalaya were adopted. All this students are belongs to migrants labour families who are working in various industries in and around of Mundra. The students does not feet any difficulty of language because the vallabh vidhalaya is Hindi medium school.

On 1st may i.e. on the world labour day, all the cheques of rs.16.04 lacs had been handed over to Mr. Dharmendra who is the director of vallabh vidhalaya

Due to COVID-19, the 10th standards students of AVMB felt difficulties in study as they do not have any digital gadget for online learning. Our APSEZ Employee had been voluntary support to provide Lenova tablet to the AVMB Students.

Adani Foundation Kutch

WORK DURING COVID-19

To fight against the COVID19, Adani foundation has stepped up to guard the health and well-being of rural communities, provide relief material to needy.

Chemical sanitization was carried in various villages of Mundra with the coordination of Fire Department APSEZ. With coordination of Port, Wilmar and Foundation free cost food facility (Breakfast, Lunch and Dinner) in port & SEZ premises and AWL area.

- **24** Sanitization work in villages
- **1900** Daily Food Facility (Breakfast, Lunch, Diner) for 1900 Labour per day
- **5500** ration kit support to needy people (Specially Fisherman, daily wedge workers, widows and senior citizen).
- **105000** Mask prepared by women SHG for Government officers / staff of SDM, ICDS, TDO, Custom, THO, Police Dept. etc.

Adani Foundation Kutch

WORK DURING COVID-19

Providing treatment is prime thing in case if any outbreak but making people aware about safety n self quarantine plus to handle the panic situation. Our mobile health care unit had provided primary treatment to community at door step and also created awareness. In this panic situation Adani Hospital Mundra had continue his IPD and OPD services. SuPoshan Sanginis led awareness drives for conveying correct hand washing techniques, importance of sanitization. They also visited pregnant women and counselling regularly. 'Awaz De' a voice message campaign was started in local kutchi language to make the people aware on COVID-19.

158	Taken care of Senior citizens at old age home
-	Awareness drives by SuPoshan Sanginies
-	Mobile health care unit provides Primary treatment at doorstap
35000	'Awaz De' a voice message campaign in local Kutchi language

Adani Foundation Kutch

Our Change Makers

In critical time of Corona, Medical Officer Dr. Deven Goswami, Dr. Narendra Dodiya and Dr. Mukesh Parmar has performed their duties at GKGH Hospital for 1.5 month period.

My Mother's dream became true

Name: Mura Keshabhai Dhuva
Place: Khavda, Bhuj, Kutch, Gujarat
Employer: Alliance Hospital (Covid 19 hospital), Mundra, Kutch, Gujarat.
Job: Joined as Nursing Assistant.
Salary: Rs. Up to 9000/- per month with lodging and boarding facilities.

Candidate Brief:

He belongs to rural family. Father is Carpenter and mother is Home maker. Parental household's monthly income prior to his placement was Rs.8, 000. His prior educational qualifications is 12th pass.

In his own words:

My mother's dream is that one of the sons should be in medical field. But due to financial constraint, I couldn't study further. I thought I will never be able to fulfill my mother's dream but fortunately, I got opportunity to get trained under GDA course and soon after its completion, I got placement in hospital. I feel proud to serve Covid19 patients and will continue doing fearlessly.

Thanks to Adani Skill Development Centre to give me opportunity to take training under DDU-GKY scheme and make me capable to take care of my family.

It helped me to become good team member and work efficiently

Name: Nipul Punjabhai Sanjot
Place: Bidada-Mandvi, Kutch, Gujarat
Training Trade & PIA: Completed a course in General Duty Assistant from Adani Skill Development Centre, Bhuj under DDU-GKY.
Employer: Alliance Hospital (Covid 19 hospital), Mundra, Kutch, Gujarat.
Job: Joined as Nursing Assistant.
Salary: Rs. Up to 9000/- per month with lodging and boarding facilities.
He can be contacted at: 9726242085

Candidate Brief:

His father and mother works as helping staff (housekeepers) in another hospital. Monthly income of family prior to his placement was 10,000/-. His prior educational qualifications is 12th pass.

In his own words:

I am youngest in Covid19 hospital here but I know this is the time to act wise. When my friends ask me do you fear working as PCA? I simply laugh and say I am trained in GDA course and fully prepared for this work. My duty is to check patient's temperature, blood pressure and oxygen level and maintain record. We get residential facility nearby hospital. To Treat Covid19 patients, needs a courage and team work and I am blessed I got this wonderful chance.

Thanks to Adani Skill Development Centre to give me opportunity to take training under DDU-GKY scheme and make me capable to take care of my family.

Name: Khoja Sahista Hussenali

Place: Kera, Bhuj, Kutch, Gujarat

Training Trade & PIA: Completed a course in General Duty Assistant from Adani Skill Development Centre, Bhuj under DDU-GKY.

Employer: Om Maternity Home, Bhuj, Kutch, Gujarat.

Job: Joined as Nursing Assistant.

Salary: Rs. Up to 7000/- per month with lodging and boarding facilities.

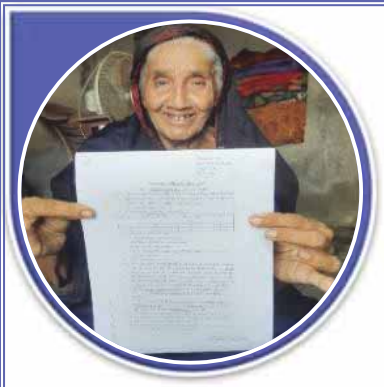
He can be contacted at: 8347304586

Candidate Brief:

She is belong to poor family. Her family's monthly income prior to his placement was Rs. 8,000 and source of income is from grocery store. Her prior educational qualifications is 12th pass.

In her own words:

My name is Sahista khoja i am living in kera village . My father's dream is that my daughter should be in medical field. But due to my mother's health issue i completed my SSC and HSC external And i thought i will never fulfill my father's dream but fortunately i came to know from my friends about GDA course and i got opportunity to trained under that course. And I started my internship at Om maternity home and on last day of internship i got placement their. I want to thank Adani skill development from the bottom of my heart to give me opportunity to take training under DDU - GKY and make me capable to became a second earner for my family.



Stick at old ages

Dhanuba a self-esteem lady from Zarpara Vllage .While I peeped in her life it seems like that her existence is only to bear grief and sadness .Her husband was passed away before 20 Years since that she has been eduring social and economic responsibility of her family by drudgery daily wages. She have two daughter who are married and two sons who are supporting her for daily end meet ,day was passed little more good combatively .....Who knows it was for short times .....

Unfortunately one more shock in her life that her elder son get Heart attack and passed away & younger son got mentally ill again she have to drudgery to get them daily bread and butter... Though her daughters called her to lives with them but she denied strongly believed to don't be burden & belongs to daughter. Now she is 70 years old and physically weak and also get illed often.

One day she came to our Rural clinc for medical check-up and was talking with deep sigh & despair about her problem. Fortunately our Employee Mr. Karsanbhai was present at their and promptly talked with her and comprehend the reality. She could not availed benefit of widow pension scheme because of the certain government limitation even after numbers of time applied and Follow-up for the same. He went along with her and Collected the essential document and submitted to the respective department later within two month she received sanction order for the same and further Rs.1250 /- Widow pension has been started which been the great support for daily meet.

She and her daughters expressed great gratitude and said that Adani Foundation is hope For the Poor and needy persons.

“Vidyadan Mahadan”

Name: Sohil Gafur Manjaliya

Place: Luni ,Mundra

AF intervention:- Education Scholarship Support

Progress & Achievement:- Studied intently and perused Graduation Degree and process for LLB admission

Salary: Working with Lawyer as a practicenor and earn Rs. 8000/Month

Back Ground : He belongs to Poor Fishermen family and sincere to study since child hood. He belongs to Poor Fishermen family and sincere to study since child hood. His father is used to Pagadiya fishing practice to get the daily end meet.

In his own words:

In our community most of the youth left study after 8th standard and engaged in Fishing practice but when I had interacted with AF staff and persuaded for further study and Scholarship support. I realized that the only education can be the game changer to strengthen my Financial condition. Later I focused to study Intentionally and dreamed to be Lawyer.

Now am working with Advocate as Assistance and do Financially support to my family.

Indeed AF sensitized me and act as catalyst to transform my life than others really I am honored by friends and Society

Real Support

Name: Harkhumben hirabhai Rabari

Place: Jinjauu,Nakhtrana

AF intervention:- Sewing Machine Support.

Progress & Achievement:- Started Embroidery and sewing work

Income : Rs.2500 to 3000/Month

Back Ground : She is 40 year old lady and disable by polio in childhood. They are five members three Children and Husband wife. Her husband is driver and the only person to earn hence financial problem is always remain host.

However She is illiterate & handicapped but symbol of etiquette and dedication. She always thought to be financial Supporter to her life partner . As belongs to Rabari community stitching & hand work is imbibed in her and she want to purchase Sewing machine for the same but Financial constrain did not allow them for same.

During community interaction she express her willing sewing machine support. we met her and after verification Support accordingly.

In his own words:

It was difficult to me as house wife to maintain budget but since I have started sewing work which added some extra money which can we expence for our children nurturing and education for their bright future.

Thanks to Adani foundation to be supporter to such disable persons

Sea of Change – I can !!

Manjaliya Jakum Osman is 36 years old Fishermen Youth though he was little dull in study but has insight sense and dedication to work. After completion of primary education he had been engaged in fishing practice with his father. Though he was earning but not enough to sustain his big family with Five Daughters .

He was always thinking to get hike and asking to provide work according to his skill like drivering ,electrician and painting work.

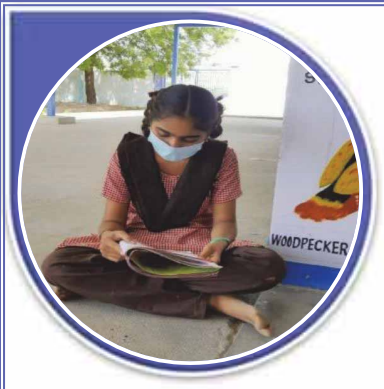
One day we offer him contract work in our dry cargo department for loading Unloading work. He started enthusiastically with 30 Labors teams and paid 100% Efforts to fetch the targets but…..Unfortunately he had to left contract due to some constrain.

Again he engaged in fishing as routine but destiny define another for him. we had called From APSEZ to need Casual labors and referenced for Jakum as having Good feedback for dedication toward work.

he accepted opportunity even did not know the process. Initially We supported for gate pass and other mandatory formalities. Currently 22 Fishermen youth are working under him.

He is saying that I am earning Approx Rs.40000/Month. And massage to Fishermen youth that I am grateful to AF to provide chance to proof my self and sustaining well. now I can Fulfill all basic amenities and invest to my daughter education.

He message to Fishermen Youth that we have great Opportunity as having ADANI port and companies to get employed.



Fostering for Future

Life without parents is like boat in the mid of the ocean without compass , Krishna was cute and beloved girl of her family. Though her parents was labour but had been grew with lots of love & fulfilled all her wishes. But who knows the destiny ,when she was 8th year old she lost her father due to heart attack. yet she get back from the shocked, her mother got remarried which pushed her in the sorrow of ocean.

she is from Siracha village & studying in 5th standard. However her uncle and aunty are looking after her fostering with all possibility, she is but since they are poor, the financial constrain cant allow them to do much more even they wish. One day when our Employee Mr. Karshanbhai Gadhvi knew about its , he met them and get review from the village leader about the reality ,They are really poor and has been taking care of Krishna with soft intend & Love. Later we informed them about the Government scheme and did all the necessary documentation to linked with Government Orphan Yojna.

Now they are being facilitated with Rs.3000 pension /Month which they deposit in Krishna bank Account to invest for their Education and wish to made her Officer now Krishna s future is secured…

Events

World Environment Day

World Environment Day was celebrated in Four Talukas by different activities related to conservation of Environment. The events were organized with coordination of Sarpanch, village leader and village committee members and difference type of activity had been carried out in this events.

Activity

- Mangrove Plantation at Luni sea coast with fisher folk community
- Tree Plantation at Mundra, Nakhtrana, Lakhpat & Tuna block.
- Inauguration of Gauchar land development work in 22 acres at Siracha village
- Tissue culture plant distribution to farmer
- 1500 herbal plants like meshvak, amla, galo, gugal, ardusi, pilu, etc planted at Nandi Sarovar biodiversity park



World Mangrove day

Web talk show was organized on the occasion of "World Mangrove days On Multi species Mangrove bio diversity with Joint effort of Guide and Adani Foundation, mundra.

Dr.V.Vijayan Kumara (Director of Gujarat institute of Desert ecology) , Mr. C.R.K Reddy (Former chief scientist ,CSIR-CSMCRI CEO) and Respected PNR sir and Gadhvi sir had delivered occasionally speech. As well as Paper presentation by GUIDE and with KSKV Scientist . Total 70 participated had joint this webinar.

Vanmhotsav

Vanmahotsav week had been celebrated by adani foundation. The main objective of the vanmahotsav is to promote forest conservation the tree plantation.

More than 4100 tree plantation activity had been carried out in Tunda, Siracha, navinal , Zarpara, Dharb, baroi, luni, samgoga, Nani bhujapar, moti bhujapar, Mota bhadiya, Gundiyali , Anjar, tuna, rampar and wandi villages of Mundra & Anjar.

World ocean day

8th June is celebrated as world ocean day. adani foundation had celebrated the world ocean day by coastal cleaning activity at Juna Bandar, Luni Bandar and Bavadi Bandar.

More than 105 Fisherman took part in this activities with great enthusiasm and zeal. Adani Foundation has scheduled awareness of coastal biodiversity, No fishing in monsoon period and conserving mangroves by allege removal and sweet water usage in initial period.

National Youth Day

The National youth day was celebrated by motivation the youth who had play significant role during corona period as a warier in various sector and society.
On the occasion Mr.Sharad Sharma –AWL plant head and Mr. Vijay Saxena –HR head MUPL were remain present and delivered speech accordingly.
17 youth (3 utthan sahayak, 4 fishermen youth, 3 corona warriors, 7 women - animal husbandry & gram rakshak dal) were appreciated.

International Women's day

Adani foundation and Britannia had jointly celebrated women's day on 10th March 2021 in which Guest of honour was Pabiben Rabari Entrepreneur Kutchh
283 women are working at Britannia and preparing biscuit n rusk. Adani foundation is supporting for sourcing, n motivation training for them and on job training Plus convincing of families of women for shift duties also.
Pabi ben had given information about her life journey n struggle and congratulated women for their joining the work. Dr Punam has informed about how to stay mentally and physically healthy plus maintain hygiene. Felicitation of 25 women by Medal who become permanent in Britannia company. Five Women shared their journey of life.

The National girl child day

Women are the epitome of strength ,Love ,sacrifice and courage.
and In the fast growing world women role is more important for the Socio , Economical & political development of Family ,Nation and world.
The National girl child day was celebrated with ICDC Department with Vahli Dikri Yojna form filling, paediatric health camp and Baby health kit distribution at Mundra . Mrs. Ashaben - CDPO Mundra was remain present in this event. Total 61 forms has received approval letter from GOG and 15 forms filled up on the same day

Ayurvedik Ukalo Distribution

Covid-19 pandemic is at the peak level and while don't having Specific treatment and vaccine taking precautionary measure and immunity boosting is the only weapon to keep away our self from Covid-19.
We have started Ayurvedic Kwadh Distribution at Various Public spot, Our Port Entry &Exit gate and APL ,AKBTP,T una with spreading awareness to mitigate rapid transition to combat against covid -19. More than 6500 people had benefitted with Ukado and Vitamin –C tablet from Mundra, Baroi Shanti van & Samudr township.

World Water day

Adani Foundation Mundra & Nakhtrana had Jointly celebrated World water Day with WASMO. Mr. R J Sonkesariya - SE irrigation dept., Ms. Dimpleben Shah - District coordinator WASMO were remain present in this event. Innovative farmer Mr.Vadilal Pokar had shared his experiance and value of drip and borewell recharge activity. more then 125 farmers of Mundra and Nakhtrana block took part in this event. To understan the value of water, drawing competition on the theme of valuing water had been organized for utthan school students.

World Disability Day

The people who living with disability, face many barriers to inclusion into key aspects of society, God blessed them with some kind of limitations with other kind of skill.Disability brings different ability.

We had celebrated world disability day on 3rd Dec with the aim to empowerment and help them to create real opportunity to make them self sustain.

In Mundra, Bita, Tuna, Anjar, Nakhtrana, Lakhpat, Bhuj & Khavda blocks of Kutch district, total 40 people were benefitted with various Tool and Machine. The District Social Welfare Officer had issued appreciation letter for our efforts. All Divyang of kutchh, have been assured to support for Government online application to facilitate Aid & Equipment well as divvying certificate and bus pass.

Awards

Adani Port and Special Economic zone ,Mundra has been awarded with 2nd prize for the National water Award from the Government of India Ministry Of Jal Shakti for the best industry for CSR Activity Category. and got cash Prize of Rs.1.5 lacs.

Awards

There was state level QCFI Award competition for (HR and CSR activity) We participated with our Namda work revival project though virtual presentation. we received diamond award.

Beneficiaries data

No	Core Area	Direct Beneficiaries	Indirect Beneficiaries	Remarks
1	Education	2098	9424	Utthan 17 Schools
2	Adani Vidhya Mandir	472	1888	AVMB ,Students
3	Community Health Mundra	19196	212969	MHCU, Rural Clinic, Senior Citizen, Health camp,
4	Community Health, Bhuj	5870	23480	Medical Support , Mahiti setu, Dead Body , Patients Care & Co-ordination
5	AHMPUL	20959	62877	0PD & IPD Patinets
6	SLD Fishermen	8035	2330	Education, Mangrove, Water and Livelihood
7	SLD –Agriculture	21190	2991	Drip, Fodder, Home Bio Gas, Tissue ,
	SLD- Women Empowerment	127	508	SHG Group Income generation & Training
8	CRC	1079	4316	Sukanya Samrudhi Yojna, Agriculture ,Fishermen,
10	Swavlamban	276	1072	(Widow women & Divyang)
11	Community Infra Structure	111855	162488	Fishermen Amenities & Shelter ,Pond Deepening, Approach
12	Nakhtrana	18528	8168	Health ,SLD, Bio Diversity & CID
13	Tuna	6717	20151	Fodder, Health & portable water
14	Lakhpat	2956	1380	Tree Plantation & Tree Guard
15	Suposhan	20565	0	Child ,Adolescent Girl ,RPA Women
16	ASDC Bhu & Mundra	577	1432	soft skill and DL .GDA & Online Training
	Total	240500	515474	

Financial Overview - Adani Foundation -Mundra
Executive Summary-Budget Utilization F.Y. 2020-201

(Rs. In Lacs)

Sr. No.	Budget Line Item	Budget 2020-21	Total LE 2020-21	% of Total Utilization
A.	Admin Expense	61.10	56.96	93.28%
B.	Education	94.56	57.87	61.20%
B1	Utthan-Education -Mundra & Anjar	64.11	52.05	81.19%
B2	Utthan : Fisherfolk	30.45	5.82	19.12%
C.	Community Health	420.70	325.12	77.28%
D.	Sustainable Livelihood Development	365.00	336.62	92.23%
E.	Community Infrastructure Development	58.30	60.13	103.14%
F.	EDM Recommended Projects	60.00	60.00	100.00%
G.	COVID 19 Support	100.00	27.05	27.05%
H *	Budget taken against Saving			
1	Wandi – Tuna Drainage Support		45.40	
2	Support to Dhrub Hospital-Dhrub		22.00	
3	Approach Road Construction at Prasla Vadi, Zarpara		16.00	
4	Participation in Gaushala Construction at Goyersama		10.25	
	Total Budget plan against Saving:		93.65	
Total AF CSR Budget :		1,159.66	1017.41	87.73%
[I]	Adani Vidya Mandir-Bhadreshwar	219.67	104.74	47.68%
[II]	Project Udaan-Mundra	50.00	49.30	98.61%
GRAND TOTAL Budget F.Y. 2021-22 :		1,429.33	1,171.45	81.96%

જીવન સાથે જીવનનિર્વાહની સામર્થવાન કામગીરી કરતું: અદાણી ફાઉન્ડેશન

અદાણી ફાઉન્ડેશન દ્વારા દેશના ૧૮ રાજ્યમાં ૨,૨૫૦ ગામડાઓમાં કરવામાં આવેલ લોક કલ્યાણના વિવિધ કર્યો : મુન્દ્રા તાલુકાના ૨૨ ગામોને સેનીટાઈઝ કરવામાં આવ્ય અસરગ્રસ્ત પરિવારોને ૧૦,૦૦૦ જેટલી રાશન કીટનું વિતરણ

(પ્રેસ રીલીઝ) મુંદરા તા. ૧૨ આજે અદાણી ફાઉન્ડેશન ૧૮ રાજ્યમાં ૨૨૫૦ ગામડાઓ સુધી લોક કલ્યાણ અર્થે કામ કરી રહ્યું છે. અદાણી ફાઉન્ડેશન કચ્છ જિલ્લામાં પણ સુસંગત, વ્યવસ્થિત રીતે, સમાજ ઉપયોગી કામગીરી કરવા હંમેશા તત્પર રહ્યું છે. તેની ...

ખારેક, દાડમ અને કેરીના ગ્રેડિંગ, ક્લીનિંગ અને પેકિંગ માટે ખાસ વ્યવસ્થા ઉભી કરાશે

મુંદ્રાના ૧૧ ગામોના ખેડૂતોના ઉત્થાન માટે 'કચ્છ કલ્પતરૂ પ્રોડ્યુસર કંપની લિ.' એગ્રોમોલ બનાવશે !

કૃષિ સંવાદદાતા રાજકોટ, તા.૨૨

- અદાણી ફાઉન્ડેશનનો સહયોગ અને ડાર... સમન્વય થકી ધરતીપુત્રોને કૃષિ ક્ષેત્રે મળ...
- ઓક્ટોબરના અંત સુધીમાં ૨૦૦ સભાસદો...

કચ્છ ભાસ્કર 30-05-2020

માસિક એ કુદરતી પ્રક્રિયા હોવાથી તેનાથી આભડછેટ ન રાખો

મુન્દ્રા અદાણી ફાઉન્ડેશન દ્વારા ફૂડ પેકેટનું વિતરણ

। મુન્દ્રા ।

મુન્દ્રા તાલુકામાં તાજેતરમાં પડેલા ભારે વરસાદના પગલે

ઉદ્ભવેલી સ્થિતિમાં અદાણી ફાઉન્ડેશન દ્વારા શહેર સમીપના ઝૂપડપટ્ટી વિસ્તારમાં પુરી, શાકના ...

મુંદરા બારોઇ વિસ્તારમાં વિવિધ સંસ્થાઓના સહયોગથી જન જાગૃતિ આરોગ્ય સપ્તાહની ઉજવણી કરવામાં આવી

જન જાગૃતિ આરોગ્ય સપ્તાહ અંતર્ગત મુંદરા-બારોઇ વિસ્તારોમાં કોરોના સામે રક્ષણ માટે અને લોકો માં જાગૃતિ લાવવા માટે મુંદરા તાલુકા પંચાયત પાસે ૨૧/૦૯ થી તાલુકા વિકાસ અધિકારી ... વિસ્તરણ અધિકારી ... સાહેબ, તાલુકા હેલ્થ ઓફિસર ... ની કામગીરી કરવામાં આવી હતી. અદાણી ફાઉન્ડેશન તેમજ ... ફાઉન્ડેશન સંજય બાપટ, મનહરભાઈ ચાવડા, અશોક ભાઈ, ... જોષી, દ્વારા ઉકાળાનું વિતરણ વિવિધ વિસ્તારો માં કરવા માં આવ્યું હતું.

મુન્દ્રા તાલુકાના ૮ ગામોના ૩૪ ખેડૂતોને બારહી ખારેકના ટીસ્યુકલ્ચર રોપાઓનું વિતરણ કરાયું

ખારેક બજાર વ્યવસ્થા માટે કચ્છ-કલ્પ તરુ પ્રોડ્યુસર કંપની બનાવશે : અદાણી ફાઉ. દ્વારા આયોજન

મુન્દ્રા : તાલુકાના જુદા જુદા ૮ ગામોમાં ખારેક સમિતિ મુન્દ્રા અને અદાણી ફાઉન્ડેશનનાં સંયુક્ત પ્રયાસથી ખારેક વાવતા ખેડૂતોને જરૂરી વળતર મળે એ હેતુસર બારહી ખારેકના ટીસ્યુ કલ્ચર રોપાઓનું ૩૪ ખેડૂતોને વિતરણ કરવામાં આવ્યું હતું. તો બીજી તરફ ખેડૂતોના આ ઉત્પાદનની બજાર વ્યવસ્થા માટે કચ્છ - કલ્પતરુ પ્રોડ્યુસર કંપની બનાવવાની કાર્યવાહી શરૂ ... ગઢવી, દત્તાત્રેય ગોખલે તેમજ અદાણી ગ્રીનપોર્ટના એક્ઝીક્યુટીવ ડાયરેક્ટર રક્ષિતભાઈ શાહ ...

અદાણી ફાઉન્ડેશને મુંદરાના વલ્લભ વિદ્યાલયનાં ૮૦૦ બાળકને દત્તક લીધાં

ભુજપુર આસપાસ ૨૩ લાખના ખર્ચે વિવિધ વિકાસકામો સંપન્ન : ખાનગી કંપનીનો સહયોગ

...ણીમાં સમુદ્ર સફાઈ અભિયાન હાથ...

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2 (vavad daily bhuj) **વાગડ** ભુજ

કચ્છમાં આંતરરાષ્ટ્રીય દિવ્યાંગ દિવસની ઉજવણી કરાઈ

મુન્દ્રા તા.ના પ્રાગપર ખાતે ૫ એકરના પ્લોટમાં બાયોડાયવર્સીટી પાર્ક બનશે

નદી સરોવરમાં એન્કરવાલા અહિંસાધામ અને અદાણી ફાઉન્ડેશન દ્વારા આયોજન

3

મુંદરા તાલુકાના વિવિધ ગામોમાં ૪ હજારથી વધુ વૃક્ષોનું વાવેતર કરાયું

અદાણી ફાઉન્ડેશન દ્વારા ઝરપરાના વીર શહિદની પુણ્યતિથિએ કરાઈ કામગીરી

મુન્દ્રા : વૃક્ષોએ ધરતી પરના મોંના સંત છે. પોતે તાપ સહન કરી બીજાને છાયો આપે છે. જેમ વૃક્ષોનું વાવેતર અને ઉછેરને ...

કચ્છના યુવાનોમાં રહેલા કૌશલ્યનો વિકાસ કરવા સાથે રોજગારી વધારાશે

શ્યામજી કૃષ્ણ વર્માના ૧૬૩મા જન્મદિને કચ્છ યુનિ. અને અદાણી સ્કિલ ડેવ. વચ્ચે કરાર

નખત્રાણા શહેરમાં આયુર્વેદિક ઉકાળાનું વિતરણ કરવામાં આવ્યું

by કચ્છ સમાચાર

રાજ્યસરકારના આઈસીડીએસ વિભાગદ્વારાસંયુક્ત ઝુંબેશયોજાઈ

મુંદરા તા.માં વહાલી દીકરી યોજના હેઠળ ૧૫૦થી વધુ બાળાને સહાય મળશે

મુંદરામાંઅદાણીફાઉન્ડેશન દ્વારા વિવિધક્ષેત્રના તારલાઓનું બહુમાન

માછીમાર સમુદાયના ઉચ્ચ અભ્યાસ કરનારા નવયુવાનોનું સન્માન કરાયું

સ્વમાનભેર રોજગારી મેળવવા યુવાનો પારંગત બને તેવો સંદેશો અપાયો

નર્સિંગ કોર્ષના ૨૦ તાલીમાર્થીઓને પ્રમાણપત્ર પહેલા જ નોકરી મળી

ભુજમાં અદાણી સ્કિલ ડેવલોપમેન દ્વારા અપાઈ હતી તાલીમ

કચ્છમાં જરૂરિયાત મુજબ નિમણુક આપવામાં પ્લેસમેન્ટ ઓફિસર નિરવ લેઉવા, કિન્નરી ઉમરાણીયા તથા રોહન સોની મદદરૂપ થયા હતા. તાલીમ માટે અસ્મિતાબેન જેઠી અને પૂર્વી ગોસ્વામી સહાયરૂપ થયા હતા. હજુ પણ જરૂરિયાત મુજબ પ્રયત્નો કરવામાં આવી રહ્યા છે. અત્રે ઉલ્લેખનીય છે કે, ગયા ઓક્ટોબર-૧૯માં બેચ શરૂ થઈ હતી. પરંતુ, લોકડાઉન આવી જતા પરીક્ષા લઈ શકાઈ નહોતી છતાં ફળ મળ્યું છે.

Disability brings different ability, it bring hope in different way let us pray the God to give confidence and strength to the person who are having some kind of limitations with other kind of skill

Thank You...

adani
Power

Ref: APL/ENV/STMNT/285/06/20
Date- 08/05/2020

To,

The Regional Officer,
Gujarat Pollution Control Board (Kutch-East)
Kandala Port Trust, Sector 8,
Ghandhidham, Kutch – 370 201 Gujarat

Sub: Submission of Environment Statement for the Year of 2019 - 20

Ref: CCA (CTO) Order No. 102106, dated 17/07/2019
GPCB ID - **29389**

Dear Sir,

With reference to above subject, kindly find enclosed herewith Environment Statement for the financial year 2019 -20 duly filed as per format of Environment Statement prescribed by GPCB (Form-V).

Kindly acknowledge the same.

Thanking you,
Yours faithfully,
for **Adani Power Limited**

(Santosh Kumar Singh)
Head-Environment

Encl: As Above

CC: **Member Secretary,**
Gujarat Pollution Control Board
Gandhinagar, Gujarat

Adani Power (Mundra) Ltd
Adani Corporate House
Shantigram, S G Highway
Ahmedabad 382 421
Gujarat, India
CIN: U40300GJ2015PLC082295

Tel +91 79 2555 4444
Fax +91 79 2555 7177
info@adani.com
www.adanipower.com

Registered Office: Adani House, Nr Mithakhali Six Roads, Navrangpura, Ahmedabad 380 009, Gujarat, India

ENVIRONMENTAL STATEMENT

FOR THE FINANCIAL YEAR

2019 - 2020

Adani Power (Mundra) Limited

Vill: Tunda & Siracha

Mundra, Kutch Gujarat

ENVIRONMENTAL STATEMENT

FORM-V

(See Rule 14)

From:

Adani Power (Mundra) Ltd.
Plot No. Tunda [180/P], Siracha,
Village: Tunda, Tal: Mundra,
Dist: Kutch
Gujarat – 370435

To,

Gujarat Pollution Control Board,
Paryavaran Bhavan,
Sector 10 A,
Gandhinagar 382010

Environmental Statement for the Financial Year ending the 31st March 2020

PART- A

(i) Name and address of the occupier of the industry operation	: Shri Pramod Kumar Saxena, **Adani Power (Mundra) Ltd.** Tunda [180/P], Siracha. Village: Tunda Tal: Mundra Dist. Kutch Gujarat: 370435
(ii) Industry Category Primary (STC Code) Secondary – (SIC Code)	: AADCA2957LST001
(iii) Production Capacity (Power)	: Phase I: 2 x 330MW Phase II: 2 x 330M +2x660MW Phase III: 3 x 660 MW
(iv) Year of Establishment	: Phase I – U#1 - Aug'09, U#2-Mar'10 : Phase II – U#3 -Aug'10, U#4-Dec'10 – U#5 - Dec'10, U#6-Feb'12 : Phase III – U#7 – Nov'11, - U#8–Mar'12, U#9-Mar'12
(v) Date of the last Environmental Statement submitted	: **22/06/2019**

PART – B

WATER AND RAW MATERIAL CONSUMPTION

a. Water Consumption for the period (April'19 – March'20)

Process* : 1184 KL/day

Cooling & Boiler Feed : 74,9091 KL/day

Domestic** : 6,706 KL/day

*DM water makeup
**Domestic water quantity includes Potable water and service water

Name of Product	Process Water Consumption per Unit of Product Output	
	During the previous year (2018-2019)	During the current year (2019-2020)
Power Generation	0.0142 Lit/Unit	0.0145 Lit/Unit

b. Raw Material Consumption

Name of Product	Name of Raw Materials	Unit	Consumption of Raw Material Per Unit of Power	
			During the previous Financial Year (2018-2019)	During the current Financial year (2019-2020)
POWER	Fuel Oil	KL	0.05 KL/mus	0.02 KL/mus
	Coal	MT	554. 18 MT/mus	543.61 MT/mus

*mus: million units

PART – C

POLLUTION DISCHARGED TO ENVIRONMENT / UNIT OF OUTPUT

a. Water:

Outfall water Quantity	: 613,127 KL/day
Avg. Domestic effluent quantity	: 117.8 KL/ Day

Note:

1. Average temperature of seawater intake and outlet water is enclosed as **Annexure I**
2. Effluent treated water is reused for water sprinkling to Coal stack yard and Road.
3. The Cooling tower (CT) blowdown and desalination reject water is utilized for FGD scrubber system to control the sulfur emission and FGD effluent is passes through aeration basin for final discharge. Treated water discharges to sea as per the norms and as per suggested by NIO recommendation.
4. Third party Environment monitoring reports is enclosed as **Annexure III**
5. Treated sewage water (STP) is being utilized in plantation & Green Belt development.

b. Air:

Sr. No.	Stack Attached to	Pollutant	Quantity of Pollutants Discharge in Mass/day (Kg/Day)	Concentration of Pollution Discharged in Mass/Volume (mg/Nm^3)	Variance (exceeding allowed Quantity)
1	Boiler unit I	PM	1153.1	37.2	No deviation
2	Boiler unit II	PM	1155.6	37.6	No deviation
3	Boiler unit III	PM	1154.2	34.6	No deviation
4	Boiler unit IV	PM	1137.0	33.9	No deviation
5	Boiler unit V	PM	1983.3	33.4	No deviation
6	Boiler unit VI	PM	2046.5	34.7	No deviation
7	Boiler unit VII	PM	2215.8	34.6	No deviation
		SO_2	10471.8	163.4	No deviation
8	Boiler unit VIII	PM	2160.4	33.4	No deviation
		SO_2	9154.3	141.7	No deviation
9	Boiler unit IX	PM	2196.6	33.5	No deviation
		SO_2	10050.2	153.4	No deviation

All Stack Emission data's are average of monthly monitoring reports.

PART - D

As specified under Hazardous Waste (Management & Handling & Transboundary movement rules) Amendment Rules 2008

Sr. No.	Hazardous Wastes	Total Quantity (KL)	
		During the previous financial year (2018-2019)	During the current financial year (2019- 2020)
1.	Used Oil	28.91	28.56
2.	Spent Resins	0	0
3.	Discarded Container	16.907	17.221
4.	Insulation Waste (Glass Wool)	1.12	1.28
5.	Oily Cotton Waste	1.1	0.75

PART – E

Solid Wastes

Details	Ash Generation (in MT)	
	(2018- 2019)	(2019- 2020)
From Process	772,462	**735,740**
From Pollution Control facilities	NIL	NIL

PART-F

Please specify the characterization (in terms of composition and quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both the categories of wastes.

Non-Hazardous Solid Waste

Solid Waste generation : Ash (**Fly ash & Wet ash**)

Ash Utilization in 2019-20 : **100.86%**

Ash utilization data is enclosed as **Annexure II**

PART – G

Impact of the Pollution abatement measures taken on conservation of natural resources and the cost of production

The unit has installed highly efficient super critical boilers in Unit 5, 6, 7, 8 and 9. The environmental advantages of super critical boiler are as below:

- Reduction in coal consumption
- Reduction in Green house gases
- Reduction of water requirements
- Overall reduction in Auxiliary Power Consumption
- Reduction in requirement of Ash Emergency land & Consumptive water

APMuL has commissioned the first supercritical 660 MW unit in India. APL, Mundra is also the world's first supercritical technology based thermal power project to have received 'Clean Development Mechanism (CDM) Project' certification from United Nations Framework Convention on Climate Change (UNFCCC).

PART – H

Additional measures / Investment proposal for environmental protection including abatement of pollution, prevention of pollution

1. Greenbelt of about 138.63 Ha developed and further development in progress.

Area (ha)	No. of Trees & Palm Planted	No. of Shrubs Planted
138.63	259,314	1,395,954

2. Online ambient air quality monitoring stations has been installed at three different directions & close to the plant boundary.
3. Seawater based FGDs has been installed at Unit 7, 8 & 9 for SO_2 reduction in Stack Emissions. The Cooling tower (CT) blow down and Desalination plant Reject will be utilized for FGD scrubber system and FGD effluent will be disposed off to the sea through aeration chamber.
4. Online Effluent Quality monitoring System has installed at final outfall channel.
5. Emergency ash pond provided for disposal of unutilized ash.
6. We have adopted Ammonia Flue Gas Conditioning System in Unit 1 & 7 for bringing down the SPM level from the flue gas is through ESP. It is based on effective dispersion & diffusion of ammonia gas in the flue gas.
7. Regular water sprinkling is being done to control the fugitive dust in CHP area and all other areas. In addition mechanical sweeping machine have been deployed for cleaning the road.

8. Wind breaking wall provided coal yard area for reducing fugitive emission & coal loss.

PART – I

Any other particulars for improving the quality of the environment

1. We have Implemented **ISO-14001:2015** Environment Management System (EMS) for Mundra TPP of Adani Power Limited. The department wise core team has been established to maintain the compliance of the standard. All Head of the Departments are responsible for ensuring the compliance of the standard. (Please refer Annexure III).
2. NABL: Accreditation of Environmental Laboratory (ISO/IEC 17025:2005) dated: 29.05.2019 vide Certificate No. TC-5215 valid until: 28.05.2021. Recertification Audit has been completed by QCI.
3. APL, Mundra also participated in GRI-G4 Sustainability reporting initiative for sustainable development and published reports for FY2014-15, FY 2015-16, FY 2016-17, FY 2017-18, FY 2018-19 which are available on the website.
4. Organic waste converter installed for converting the canteen waste into organic manure. The organic manure is used for gardening.
5. Fly ash utilized to produce vermicomposting
6. The Rooftop Rainwater collection & groundwater recharging Scheme has been adopted & installed at three locations within plant premises
7. Green belt development/plantation work is swing and our efforts are being made to develop more greenery in and around the plant.
8. Digital LED Display board is installed at main gate of plant for display the environmental parameters.
9. Integrated Ash silo system has been commissioned & make operational to handle ash at single location to minimize fugitive emission & minimize vehicle movement.
10. Ash bagging plant has been commissioned & make operational for fine ash bagging for export to increase ash utilization.
11. Boiler & turbine high-energy drain passing survey has been done for reducing heat losses
12. Condenser cleaning for vacuum improvement, which increase plant efficiency & improve heat rate
13. Best start-up practices adopted for reducing start-up oil consumption
14. Replacement of cooling tower fans existing blades with energy efficient blades for aux. power saving
15. CW pump & CT fans operation optimization for auxiliary power saving
16. Compressor operation optimization for auxiliary power saving.
17. Periodic energy audit and implementation

18. Elimination of chlorine tonner by replacing sea water based Electro chlorination plant. This eliminates the chlorine gas hazards from the environment.

19. Eco-Park:

An Eco-Park is developed, which is being prepared with waste and reusable material. The main concept for this park is to promote waste recovery, recycling, reuse and environmental engineering among the employees and visitors. It also gives a platform for experimental garden for plantation activities. This will also attracts different birds, reptiles and butterflies, which will help in maintaining the ecosystem of the area.

Sign: 

Name: Santosh Kumar Singh
Designation: Head - Environment
Address: Adani Power (Mundra) Ltd,

Adani Power (Mundra) Limited

Annexure I

Monthly Temperature Average Differential Records

(April'2018 to March'2019)

Months	Intake Reservoir °C	Outfall channel °C	Temp. Difference °C
April.2019	30.0	33.2	3.0
May.2019	30.8	34.2	3.2
June.2019	30.7	34.2	3.5
July.2019	29.3	32.5	3.2
August.2019	28.6	32.0	3.4
September.2019	28.6	32.0	3.4
October.2019	29.8	32.7	3.0
November.2019	28.0	31.2	3.2
December.2019	25.2	27.4	2.2
Janaury.2020	22.7	24.9	2.1
Febraury.2020	25.0	26.8	1.8
March.2020	25.9	28.5	2.6

Note: * Outfall channel under shutdown

Adani Power (Mundra) Limited

Annexure II

Ash Utilization Report

April-2019 to March-2020

Month	Ash Production (MT/month)	For Cement manufacturing (MT/Month)	For Brick/ Construction/Traders (MT/Month)	Reclamation of Low Lying Areas (MT/Month)	Ash Dyke (MT/ Month)	Bottom Ash (Export)	Dyke Ash lifted for Reutilization (MT)	Total Ash Utilized (Silo + Dyke) (MT)
April-19	78,612	50,603	21,300	13,059	0.00	0	0	84,962
May-19	68,058	30,397	13,851	14,699	0.00	0	0	58,947
June-19	59,914	21,584	30,588	12,621	0.00	0	0	64,792
July-19	67,320	46,164	15,419	11,248	0.00	0	0	72,831
August-19	58,865	21,818	11,278	22,131	0.00	0	0	55,227
September-19	58,225	38,393	12,410	9,665	0.00	0	0	60,468
October-19	70,740	34,753	23,727	11,803	0.00	0	0	70,283
November-19	63,953	22,111	32,005	10,816	0.00	0	0	64,933
December-19	52,156	28,172	14,689	8,798	0.00	0	0	51,660
January-20	56,888	27,319	18,311	9,029	0.00	386	0	55,045
February-20	57,867	29,991	20,370	9,450	0.00	367	0	60,178
March-20	43,141	15,661	16,214	10,457	0.00	415	0	42,746
Total	**735,740**	**366,965**	**230,163**	**143,777**	**0.00**	**1168**	**0**	**742073**

*Total 2491 MT Ash filled in bags & will be utilized in upcoming month