

**ENVIRONMENT CLEARANCE COMPLIANCE**

**(April - 2023 TO September - 2023)**

**TORRENT POWER LTD.**

**SUGEN MEGA POWER PROJECT**

Period from April 2023 to September 2023

| Rule / Section No. | Compliance / Regulatory requirement   | Compliance Status   |
|--------------------|---|---|
| 2(i)               | All the conditions stipulated by GBCB vide their letter nos. PC/NOC/SRT-1351/687 dated 9 <sup>th</sup> January 2004, SRT-1351/13954 dated 5 <sup>th</sup> May,2004 and PC/NOC/SRT-1351/14052 dated 12 <sup>th</sup> May,2004 should be strictly implemented   | Complied  |
| 2(ii)              | Total land requirement should be restricted to 100.00 ha.   | Complied  |
| 2 (iii)            | Three stack of 70 m height each should be installed with continuous online monitoring system.   | Complied  |
| 2(iv)              | Nox emissions should be restricted to 50 ppm for gas and 100ppm for naphtha by installation of low dry NOx burners.   | Complied  |
| 2(v)               | Gas requirements shall be 2700 TPD having calorific value of 8000 kcl/kg.   | Complied to amended. requirement of 3320 TPD for Sugen 3 units  |
| 2(vi)              | Naphtha @ 5,250 TPD having calorific value of 13,000 kcl/kg with sulphur content not exceeding 0.1% shall be used in case of emergency and non-availability of gas  | Not applicable  |
| 2(vii)             | Water requirement should not exceed 35,456 m3/day. For continuous monitoring of the treated waste water quality, a continuous monitoring station at the final outlet should be installed (before discharge of the waste water into the Tapi river through Dohkar Nala). The water quality will be as per the standards prescribed by the GPCB | Complied, with revised. condition requirement after expansion < 42624 KLD   |
| 2(viii)            | Closed Circuit cooling devices should be provided and minimum makeup water should be used.  | Complied  |
| 2(ix)              | Adequate safety measured/devices should be provided / installed to contain gas/naphtha in case of accident. Leak detection devices should be installed at strategic places for early detection and warning.   | Complied  |
| 2(x)               | Necessary permission from Chief Controller of Explosives should be obtained before starting the plant operation   | Complied<br>Petroleum storage license for 20KL for BSDG 1 & 2 Diesel Storage tanks is available.<br>License No. P/WC/GJ/15/2458 (P177188) available and valid till 31.12.2033.<br>Gas Cylinder Storage License No. G/WC/GJ/06/1463 available and renewed online and valid till 30.09.2030 for 339 nos. of Hydrogen Gas Cylinders and 270 nos. of Carbon Dioxide Gas |

| Rule / Section No. | Compliance / Regulatory requirement  | Compliance Status                                 |
|--------------------|--|---|
|                    |  | Cylinders.  |
| 2(xi)              | Noise level should be limited to 75dBA, and regular maintenance of equipment be undertaken. For people working in the area of generator and other high noise area, earplug should be provided.   | Complied  |
| 2(xii)             | For controlling fugitive dust, regular sprinkling of water in vulnerable areas of the plant should be ensured.   | Complied  |
| 2(xiii)            | Rainwater harvesting should be adopted. Central Groundwater Authority/Board shall be consulted for finalization of appropriate water harvesting technology before commencement of commissioning of the plant.  | Complied  |
| 2 xiv)             | Regular monitoring of the air quality should be carried out in and around the power plant and records maintained. Complete analysis of the recorded data should be regularly undertaken, and results should be submitted to the ministry six month for review.   | Complied  |
| 2 xv)              | All other mitigative measure shall be taken as enumerated in Chapter 6 of EIA  | Complied  |
| 2 xvi)             | The Project proponent should be advertise at least in two local news paper widely circulated in the region around the project of which should be in vernacular language of the locality concerned , informing that the project has been accorded environmental clearance and copies of clearance letters are available with the state pollution control board / committee and may also be seen at Website of Ministry of Environment and Forest at <a href="http://envfor.nic">http://envfor.nic</a> | Complied  |
| 2 xvii)            | A separate environment monitoring cell with suitable qualified staff should be set up for implementation of the stipulated environmental safeguard   | Complied  |
| 2 xviii)           | Half-yearly report on the status of implementation of the stipulated conditions and environmental safeguard should be submitted to the Ministry / regional Office / CPCB /SPCB   | Complied. Report submitted to MOEFCC/ CPCB & GPCB |
| 2 xix)             | Regional Office of the Ministry of Environment & Forest located at Bhopal will monitor the implementation of the stipulated condition. Completed set of Environmental Impact Assessment Report and Environment management plan should be forward to the Regional Office for their use during monitoring.   | Complied  |

| Rule / Section No. | Compliance / Regulatory requirement  | Compliance Status |
|--------------------|--|-------------------|
| 2 xx)              | Separate funds should be allocated for the implementation of environmental protection measures along with item-wise break-up. This cost should be included as part of the project cost. The funds earmarked for the environment protection measure should not be diverted for other purpose and year –wise expenditure should be reported to the Ministry  | Complied          |
| 2 xxi)             | The Project authorities should inform the Regional Office as well as the Ministry the date of financial closure and final approval of the project by the concerned authorities and the dated of start of land development work   | Complied          |
| 2 xxii)            | Full co operation should 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.  | Info Noted        |
| 3                  | The Ministry reserves the right to revoke the clearance if conditions stipulated are not implemented to the satisfaction of the Ministry.  | Info Noted        |
| 4                  | The Environmental clearance accorded shall be valid for a period of 5 years for construction / operation of the power plant. In case, if the project authorities fails to do so within this stipulated period, this environmental clearance shall stand lapsed automatically.  | Info Noted        |
| 5                  | In case of any deviation or alteration in the project proposed from these submitted this Ministry for clearance, fresh reference should be made to the Ministry to assess the adequacy of the condition(s) imposed and to add additional environmental protection measures required, if any.   | Info Noted        |
| 6                  | The above stipulation would be enforced among other under the water (Prevention and Control of pollution) Act, 1974, the Air (Prevention and Control of pollution) Act, 1981, The Environment (Protection) Act, 1986, Hazardous Waste (Management and Handling) Rules, 1989 and its amendments, the public liability Insurance Act,1991 and its amendments, The Environment Impact Assessment Notification of January 1994 and its amendments. | Complied          |

**Status of compliance of the stipulated conditions of the Environment Clearance No: No. J-13012/2 /2004-IA.II(T) dated : 07.12.2007 for Expansion capacity from 1050 MW to 1147.50 MW Gas based CCPP of Torrent Power Ltd. (SUGEN), at Akhakhol, District Surat (Gujarat)**

**Period from April 2023 to September 2023**

| <b>Rule / Section No.</b> | <b>Compliance / Regulatory requirement</b>                           | <b>Compliance Status</b>  |
|---------------------------|--|---|
| 2(i)                      | Natural gas/RLNG will only be used. Naptha will not be used.         | Complied  |
| 2(ii)                     | The gas consumption will be increased from 2700 TPD to 3320 TPD.     | Complied to amended requirement of 3320 TPD for Sugen 3 Units           |
| 2(iii)                    | Water consumption will be reduced from 35456 m3/day to 31968 m3/day. | Complied with revised condition requirement after expansion < 42624 KLD |
| 3(i)                      | Natural gas / RLNG shall only be used as fuel.                       | Complied  |
| 3(ii)                     | Greenbelt shall be raised in an area of 33 ha.                       | Complied  |

**Status of compliance of the stipulated conditions of** the Environment Clearance No: J 13012/74/2009-IA.II (T) dated 09.09.2010 for expansion of existing 3x382.5 MW Gas based CCPP by addition of 1x382.5 MW (**UNOSUGEN**) of Torrent Power Ltd. , at Akhakol, District Surat (Gujarat)

**Period from April 2023 to September 2023**

| S. No.                         | Condition   | Compliance Status  |
|--------------------------------|---|--|
| <b>General</b>                 |   |  |
| 1.                             | Gas requirement will be 2 MMSCMD  | Complied for expansion unit of Unosugen                                  |
| 2.                             | Water requirement of about 10,656 KLD for the proposed expansion The total water requirement for the existing and proposed expansion will be 42,624 KLD   | Complied for all Four units.<br>Unosugen + Sugen 3 Units                 |
| 3.                             | A stack of 70 m for non fired Heat Recovery steam Generator will be provided. Low NOx hybrid burners will be installed  | Complied   |
| <b>Specific Conditions - A</b> |   |  |
| 1)                             | Change of Fuel – apply again for EC with necessary public hearing.  | Noted (No change of fuel envisaged)                                      |
| 2)                             | NOx, emission from each Gas Turbine shall not exceed 50ppm  | Complied   |
| 3)                             | Stack of 70 m shall be provided with continuous online monitoring equipment. Exit velocity of flue gases should not be less than 25m/s  | Complied   |
| 4)                             | COC shall be adopted at 5   | Average COC maintained at 5.7 to conserve water                          |
| 5)                             | No ground water shall be extracted for the project work at any stage.   | Complied   |
| 6)                             | Minimum required environmental flow suggested by the Competent Authority of the State Govt. (if any) shall be maintained in the Channel/ Rivers (as applicable) even in lean season.  | Complied   |
| 7)                             | Hydro – Geological study of the area shall be reviewed annually to assess the sustainability of the source of water particularly in lean season. The review report duly vetted by the concerned Dept. in the state government shall be submitted to the Ministry. In case adverse impact on ground and surface water is observed, immediate mitigating steps to contain the same shall be undertaken. | Complied<br>Submitted letter dated 17th May 2013 to MOEFCC and GPCB      |
| 8)                             | Green belt consisting of 3 tiers of plantations around the plant of 150m width and adequate tree density not less than 2500 per ha with survival rate not less than 75% shall be developed. In areas where 150m width is not possible, Green Belt of not less than 50m width shall be raised with a adequate justification.   | Complied   |
| 9.1)                           | Reuse the effluent with prescribed standards to maximum extent.   | Complied   |
| 9.2)                           | Arrangement shall be made that effluents and storm water do not get mixed.  | Complied   |
| 10)                            | A sewage treatment plant shall be provided and treated sewage shall be used for greenbelt. Continuous monitoring of effluent discharge shall be undertaken, it shall be ensured that when discharge enters the natural drain the temperature of effluent shall be at ambient.   | Complied   |
| 11)                            | Monitoring of ground and surface water quality, the monitored data shall be submitted to the ministry regularly. Monitoring point shall be located between the plant and drainage in the direction of flow of ground water and records maintained. Monitoring for heavy metals in ground water shall be undertaken.   | Complied.<br>Reports are submitted to MOEFCC, GPCB & CPCB.               |
| 12)                            | A well-designed rainwater harvesting shall be put in place. Central Groundwater Authority/Board shall be consulted for finalization of appropriate rainwater harvesting technology within a period of 3 months from the date issue of clearance and details shall be furnished. Status of implementation shall be   | Complied.<br>Study conducted by TCE. Report submitted to CGWB Ahmedabad. |

|                               |  |   |
|-------------------------------|--|---|
|                               | submitted to the Regional Office of the Ministry.  |   |
| 13)                           | Adequate safety measures shall be provided in the plant area to check/minimize spontaneous fires 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.  | Complied  |
| 14)                           | Noise levels emanating from turbines shall be so controlled that the noise in the work zone shall be limited to 75dBA at 1m from the source of noise. For people working in the high noise area, requisite personal protective equipment like earplugs/earmuff 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. | Complied  |
| 15.1)                         | Regular monitoring of ground level concentration of SO <sub>2</sub> , NO <sub>x</sub> , RSPM (PM <sub>10</sub> and PM <sub>2.5</sub> ) etc. shall be carried out in the impact zone and records maintained. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to Regional Office of this Ministry.   | Complied.<br>Monthly environment reports are submitted to GPCB (HO & RO). Half yearly report submitted to ministry.   |
| 15.2)                         | The data shall also be put on the website of the company.  | Complied  |
| 16.1)                         | An amount of 6.8 Crores shall be earmarked as one-time capital cost for CSR programme.   | Complied  |
| 16.2)                         | Subsequently a recurring expenditure of Rs. 1.4 Crores per annum shall be earmarked as recurring expenditure for CSR activities.   | Annexure – A attached   |
| 16.3)                         | Details of the activities to be undertaken shall be submitted within one month along with road map for implementation.   | No longer applicable as plant is commissioned and operational.  |
| 17.1)                         | As part of CSR program, 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 orchards, vocational training etc. can form a part of such programme.   | Company undertakes various CSR activities some of which are listed in Annexure 'A'.<br>In addition, local populace are offered earning opportunities by hiring them for various services/ jobs viz., Horticulture, Driving, employment in company's Canteen, jobs in Hospital project, etc. |
| 17.2)                         | The 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.   |   |
| 18)                           | It 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.   | The company has already spent Rs. 6.80 Cr as per MOEFCC guideline.  |
| <b>General Conditions - B</b> |  |   |
| 1)                            | Storage facilities for auxiliary liquid fuel such as LDO and/HFO/LSHS (if any) shall be made in the plant area in consultation with Department of Explosive, 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.  | Complied<br><br>Site Emergency plan is in place.  |
| 2)                            | First Aid and sanitation arrangements shall be made for the drivers and other  | Complied during project   |

|       |  |  |
|-------|--|--|
|       | contract workers during construction phase.  | phase  |
| 3.1)  | 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, crèche etc.  | Complied   |
| 3.2)  | The housing may be in the form of temporary structures to be removed after the completion of the project.  | Complied   |
| 4)    | 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 <a href="http://envfor.nic.in">http://envfor.nic.in</a> | Complied   |
| 5)    | A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad / Municipal Corporation, urban local Body and the Local NGO, if any, from whom suggestions/representations, if any, received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent   | Complied   |
| 6)    | An Environmental Cell shall be created at the project site itself and shall be headed by an officer of appropriate seniority and qualification. It shall be ensured that the head of the Cell shall directly report to the head of the organization.   | Complied   |
| 7)    | The proponent shall upload the status of compliance of the stipulated environmental clearance 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 the SPCB.   | Complied.<br>Half yearly EC compliance and environment reports are uploaded on the company website and reports are submitted to MOEFCC, CPCB & GPCB. |
| 8)    | The project proponent shall also submit six monthly reports on the status of compliance of the stipulated EC conditions including results of monitored data (both in hard copies as well by e- mail) to the respective Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB.  | Complied. Half yearly EC compliance and environment reports are submitted to MOEFCC, CPCB & GPCB regularly.  |
| 9.1)  | 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.  | Complied.<br>Half yearly EC compliance and environment reports are submitted to MOEFCC, CPCB & GPCB regularly.                                       |
| 9.2)  | 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.   | Complied   |
| 10.1) | The Regional Office of the Ministry of Environment & Forests will monitor the implementation of the stipulated conditions. A complete set of documents including Environmental 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.   | Complied   |
| 10.2) | Project proponent will up-load the compliance status in their website and up-date the same from time to time at least six-monthly basis.   | Complied   |



|       |  |   |
|-------|--|---|
| 10.3) | Criteria pollutants levels including NOx (from stack & ambient air) shall be displayed at the main gate of the power plant and in public domain.   | Complied  |
| 11)   | 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 should be reported to the Ministry.                              | Complied.<br>Project is completed and commissioned.                                 |
| 12)   | 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. Project is completed and under commercial operation since 4th April 2013. |
| 13)   | Full cooperation to Scientists/Officers from MOEF & RO and CPCB/SPCB.  | Complied  |
| 14.   | The Ministry of Environment and Forests reserves the right to revoke the clearance if conditions stipulated are not implemented to the satisfaction of the Ministry. The Ministry may also impose additional environmental conditions or modify the existing ones, if necessary  | Info Noted  |
| 15.   | EC is valid for the period of Five Years to start operations by the power plant.   | Complied  |
| 16.   | Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provision of Environment (Protection) Act, 1986  | Noted   |
| 17.   | In case of any deviation or alteration in the project proposed including coal transportation system from those submitted to this Ministry for clearance, fresh reference should be made to the Ministry to assess the adequacy of the condition(s) imposed and to add additional environmental protection measures required, if any.   | Noted   |
| 18.   | The above stipulation would be enforced among others under the Water (Prevention and Control of pollution) Act, 1974, the Air (Prevention and Control of pollution) Act, 1981, The Environment (Protection) Act, 1986 and rules there under, Hazardous Waste (Management and Handling) Rules, 1989 and its amendments, the public liability Insurance Act,1991 and its amendments, | Complied  |
| 19.   | Any appeal against this environmental clearance shall lie with the National Environment Appellate Authority, if preferred, within 30 days as prescribed under section 11 of the National Environment Appellate Act, 1997   | Noted   |

**Annexure A**

382.50 MW Unosugen (Expansion of Sugen)

(File No. J13012/74/2009-IA-II(T)- SUGEN Environment Clearance dated September 09,2010)

16.2) Subsequently, a recurring expenditure of Rs 1.40 crs per annum shall be earmarked as recurring expenditure for CSR activities.

The following is the recurring expenses on CSR for the period Apr 2023 to Sept 2023:

Expenses incurred on:

Community CSR activities like,

Training to local youths, Medical facilities to nearby

villages, social support, welfare activities for labour.....Rs. 0.83 cr.

Medical facilities, camps and Mobile OPD for

children in Kamrej taluka under REACH programme..... Rs. 9.75 cr.

(total expenses incurred Rs 19.50 crs, of which Rs 9.75 crs

incurred against Unosugen recurring expenditure and

balance Rs. 9.75 cr. against 1200 MW Dgen Mega Power Project)

Total.....Rs.10.58 cr.

**APRIL 2023**  
**TO**  
**SEPTEMBER 2023**

**HALF YEARLY ENVIRONMENTAL  
MONITORING REPORT**

**M/s. TORRENT POWER LTD.  
SUGEN MEGA POWER PROJECT  
TA: KAMREJ, DIST-SURAT**

**APRIL 2023 TO SEPTEMBER 2023**

**PREPARED BY:**

**M/s. POLLUCON LABORATORIES PVT.LTD.**

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**TC 5945**

**ISO  
9001:2015**

**ISO  
14001:2015**

**ISO  
45001:2018**

## "HALF YEARLY ENVIRONMENTAL MONITORING REPORT"

**M/s. TORRENT POWER LTD.**  
**SUGEN MEGA POWER PROJECT**  
**TA: KAMREJ, DIST-SURAT.**

For and on behalf of Pollucon Laboratories Pvt. Ltd., Surat

Approved by : Dr. Arun Kumar Bajpai

Signed : 

Designation : Lab Manager (Q)



This report is prepared by Pollucon laboratories Pvt. Ltd. with all reasonable skills, care and diligence, incorporating our General Terms and Conditions of Business and taking account of the resources devoted. Name of the sampling location / sample identity details – provided by client itself.



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# **CHAPTER 1**

## **1.0 INTRODUCTION**

**MONITORING PERIOD: APRIL 2023 TO SEPTEMBER 2023**

Environmental Monitoring was carried out as per the scope of work.

Ambient Air Quality Monitoring was conducted. Sampling and analysis for ambient air at specified locations performed; based on the methodology specified in National Ambient Air Quality Standards by Ministry of Environment and Forest, Government of India.

Ground Water samples were collected during the monitoring period. Sampling and analysis for ground water was carried out as per the procedure specified in APHA (23<sup>rd</sup> Edition) and Codes as per the Bureau of Indian standard.

Treated Effluent water and sewage water sampling and analysis carried out on monthly basis. Noise measurement carried out for day and night time on monthly basis. Plant stack sampling of all operational units carried out on monthly basis and Diesel Generator stack sampling and analysis carried out on quarterly basis. Soil sampling is also carried out on quarterly basis.

The equipment used for sampling and analysis are calibrated and certified as per NABL requirements with NIST traceability as per ISO/IEC 17025:2017.

Pollucon laboratories Pvt. Ltd., Surat is recognized by Ministry of Environment & Forest, Government of India, New Delhi under the EPA- article 12 A. along with the recognition as Environmental Auditors; under the Honorable High Court; Gujarat Orders.

Laboratory set up is having international recognition from NABL (National Accreditation Board for Laboratories) under the ministry of Science & Technology as per ISO/IEC 17025:2017 for the Environmental / Food / Air / Solid-Hazardous waste, Construction material etc. (Detailed scope is available on NABL web site).

Entire administration and operations of the laboratory is as per ISO 9001:2015 quality systems and is certified by TUV consultants.

**Applicable Codes as per Bureau of Indian Standards:**

| <b>SR. NO.</b> | <b>MONITORING DETAILS</b>      | <b>APPLICABLE BIS CODE</b> |
|----------------|--------------------------------|----------------------------|
| 1              | Ambient Air Quality            | IS:5182/ CPCB Method       |
| 2              | Ground Water Quality           | IS:3025                    |
| 3              | Treated Effluent Water Quality | IS:3025                    |
| 4              | Treated Sewage Water Quality   | IS:3025                    |
| 5              | Noise Level                    | IS 9876/IS 9989            |
| 6              | Soil Analysis                  | USDA/IS 2720 etc.          |
| 7              | Stack Emission Analysis        | IS:11255                   |



**The Environment Monitoring was carried out at the following locations:**

| SR. NO. | DESCRIPTION                              | NO. OF LOCATION | FREQUENCY | PARAMETERS   | MONITORING STATIONS   |
|---------|--|-----------------|-----------|--|---|
| 1       | <b>Stack Monitoring</b>                  |                 |           |  |   |
|         | <b>(a) Stack -Plant Unit</b>             | 8               | Monthly   | a) Particulate Matter<br>b) Oxides of Sulphur<br>c) Oxides of Nitrogen   | (L1 – SM1) Heat recovery and Steam Generation 10 UHA<br>GPS Location:N21°20.340' , E 72°59.342'<br>(L2 - SM 2) Heat recovery and Steam Generation 20 UHA<br>GPS Location:N21°20.364' , E 72°59.349'<br>(L3 - SM 3) Heat recovery and Steam Generation 30 UHA<br>GPS Location:N21°20.408' , E 72°59.367'<br>(L4 - SM 4)Heat recovery and Steam Generation 40 UHA<br>GPS Location:N21°20.445' , E 72°59.384'<br>(L5 - SM 5) Natural Gas Dew Point Water Heater 00EKT01<br>GPS Location:N21°20.369' , E 72°59.422'<br>(L6 - SM 6) Natural Gas Dew Point Water Heater 00EKT02<br>GPS Location:N21°20.370 , E 72°59.424'<br>(L7 - SM 7) Natural Gas Dew Point Water Heater-1 40EKT01<br>GPS Location:N21°20.394' , E 72°59.398'<br>(L8 - SM 8) Natural Gas Dew Point Water Heater-2 40EKT02<br>GPS Location:N21°20.392' , E 72°59.402' |
|         | <b>(b) Stack - Diesel Generator Unit</b> | 3               | Quarterly | a) Particulate Matter<br>b) Oxides of Sulphur<br>c) Oxides of Nitrogen<br>d) Non Methyl Hydro Carbon<br>e) Carbon Monoxide<br>f) Sulfur Content in fuel sample   | (L9 - SM 9) Black Start Diesel Generator 00XKA01<br>GPS Location:N21°20.345' , E 72°59.300'<br>(L10 - SM 10 )Black Start Diesel Generator 00XKA02<br>GPS Location:N21°20.345' , E 72°59.301'<br>(L11 - SM 11) Emergency Diesel Generator 40XKA<br>GPS Location:N21°20.503' , E 72°59.339'   |
| 2       | <b>Ambient Air Quality Monitoring</b>    | 6               | Monthly   | a) Particulate Matter (PM <sub>10</sub> )<br>b) Particulate Matter (PM <sub>2.5</sub> )<br>c) Oxides of Sulphur<br>d) Oxides of Nitrogen<br>e) Lead as Pb<br>f) Benzo (a) Pyrene (BaP)<br>g) Arsenic as As<br>h) Nickel as Ni<br>i) Carbon Monoxide as CO<br>j) Benzene as C <sub>6</sub> H <sub>6</sub><br>k) Ammonia as NH <sub>3</sub><br>l) Sulphur Dioxide as SO <sub>2</sub><br>m) Nitrogen Dioxide as NO <sub>2</sub><br>n) Ozone as O <sub>3</sub> | (L1-A1) Station A – SUKAN BUILDING<br>GPS Location: N 21°20.694' , E 72°59.494'<br>(L2-A2) Station B – SWITCH YARD<br>GPS Location: N 21°20.639' , E 72°59.144'<br>(L3-A3) Station C – SHARDASHISH COLONY<br>GPS Location: N 21°19.777' , E 72°59.056'<br>(L4-A4) Station D – SURBHI (INTEK WELL)<br>GPS Location: N 21°19.191' , E 72°58.859'<br>(L5-A5) Station E – AKHAKHOL VILLAGE<br>GPS Location: N 21°20.072' , E 72°59.498'<br>(L6-A6) Station F – NAVI PARDI VILLAGE<br>GPS Location: N 21°20.014' , E 72°57.624'  |

| SR. NO. | DESCRIPTION                     | NO. OF LOCATION | FREQUENCY | PARAMETERS   | MONITORING STATIONS  |
|---------|---------------------------------|-----------------|-----------|--|--|
| 3       | Ground Water Sampling           | 2               | Monthly   | a) pH<br>b) Temperature<br>c) Turbidity<br>d) Conductivity<br>e) Total Dissolved Solids<br>f) Total Suspended Solids<br>g) Alkalinity<br>h) Total Hardness<br>i) Ca Hardness as CaCO <sub>3</sub><br>j) Mg Hardness as CaCO <sub>3</sub><br>k) Chloride as Cl<br>l) Nitrate as NO <sub>3</sub><br>m) Sulphate as SO <sub>4</sub><br>n) Iron as Fe<br>o) Mercury as Hg<br>p) Cadmium as Cd<br>q) Selenium as Se<br>r) Arsenic as As<br>s) Cyanide as CN<br>t) Lead as Pb<br>u) Zinc as Zn<br>v) Hexavalent Chromium as Cr <sup>+6</sup><br>w) Water Table (Depth) | (L1-GW1) AKHAKHOL VILLAGE<br>GPS Location: N 21°,20.150' E 72 °, 59.497'<br>(L2-GW2) NAVI PARDI VILLAGE<br>GPS Location: N 21°,19.914' E 072 °, 57.583'        |
| 4       | Treated Effluent Water Sampling | 1               | Monthly   | a) pH<br>b) Temperature<br>c) Colour<br>d) Oil and Grease<br>e) Suspended Solid<br>f) Phenolic Compound<br>g) Sulphide<br>h) Total Dissolved Solids<br>i) BOD (3 day @ 27 °C)<br>j) COD<br>k) Hexavalent Chromium<br>l) Total Chromium<br>m) Ammonical Nitrogen<br>n) Chloride<br>o) Sulphate  | (L1-TEW) GUARD POND<br>GPS Location: N 21°,20.399' E 072°,59.021'  |
| 5       | Sewage Water Sampling           | 2               | Monthly   | a) pH<br>b) BOD (3 Days @ 27 °C)<br>c) Suspended Solids<br>d) Fecal Coliform   | (L1 – SW1) SUGEN STPLANT (SUGEN)<br>GPS Location:N21°,20.393' E 072°,59.087'<br>(L2 – SW2) Unit- 40 (BEHIND ASWAD)<br>GPS Location:N21°,20.499' E 072°,59.500' |

| SR. NO. | DESCRIPTION                 | NO. OF LOCATION | FREQUENCY                    | PARAMETERS  | MONITORING STATIONS   |
|---------|-----------------------------|-----------------|------------------------------|---|---|
| 6       | Noise Level Data Monitoring | 14              | Monthly                      | a) Daytime Noise Level in dB(A)<br>b) Nighttime Noise Level in dB(A)  | (L1 - N1) Boundary wall at Back Side of GSPL gas station<br>GPS Location: N 21°20.370', E 072°59.462'<br>(L2 - N2) Boundary wall at Back Side Maintenance Lay Down<br>GPS Location: N 21°20.279', E 072°59.365'<br>(L3 - N3) Boundary wall at Backside of fire water reservoir<br>GPS Location: N 21°20.237', E 072°59.252'<br>(L4 - N4) Nr. Sukan : AAQM Station<br>GPS Location: N 21°20.682', E 072°59.579'<br>(L5 - N5) Boundary wall at Barrier Gate : 2 - Tejpath<br>GPS Location: N 21°20.686', E 072°59.112'<br>(L6 - N6) Boundary wall at Banyan tree Gate to satkar<br>GPS Location: N 21°20.439', E 072°59.981'<br>(L7 - N7) Shardashish : Nr. Ashok Circle -Pond gate<br>GPS Location: N 21°19.889', E 072°58.867'<br>(L8 - N8) Shardashish : Akhakhol Gate<br>GPS Location: N 21°19.87', E 072°59.092'<br>(L9 - N9) Near Swagat Gate<br>GPS Location: N 21°19.518', E 072°59.440'<br>(L10 - N10) Surbhi<br>GPS Location: N 21°19.19', E 072°58.871'<br>(L11 - N11) Akhakhol Village<br>GPS Location: N 21°20.175', E 072°59.362'<br>(L12 - N12) NaviPardi Village<br>GPS Location: N 21°19.798', E 072°57.541'<br>(L13 - N13) Unit- 40 Entry Gate - East Side<br>GPS Location: N 21°20.439', E 072°59.527'<br>(L14 - N14) Tejpath Turn - West Side Of Sanman Circle<br>GPS Location: N 21°20.823', E 072°59.233' |
| 7       | Soil Sampling               | 6               | Six Monthly - (Six Location) | a) Bulk Density<br>b) Organic matter<br>c) Water Holding Capacity<br>d) pH (20% slurry)<br>e) Colour<br>f) Texture<br>1. Clay<br>2. Silt<br>3. Sand<br>g) Bicarbonates<br>h) Chlorides<br>i) Conductivity<br>j) Potassium<br>k) Phosphorus<br>l) Nitrogen | (L1 - SL1) Hazardous Waste Storage Area<br>GPS Location: N21°20.403', E 72°59.063'<br>(L2 - SL2) Oil Separator UBH (Near URD)<br>GPS Location: N21°20.372', E 72°59.086'<br>(L3 - SL3) Oil Separator UBH (Switchyard)<br>GPS Location: N21°20.532', E 72°59.177'<br>(L4 - SL4) Biocide and Chemicals Storage Building (UPQ)<br>GPS Location: N21°20.322', E 72°59.190'<br>(L5 - SL5) Oil Separator UBH (Near Chiller Building)<br>GPS Location: N21°20.315', E 72°59.270'<br>(L6 - SL6) Water Treatment Chemical Storage (UGD)<br>GPS Location: N21°20.303', E 72°59.336'<br>(L7 - SL7) Storage of Lubricant & Chemical<br>GPS Location: N 21°20.331', E 72°59.320'<br>(L8 - SL8) Oil Separator UBH (Opp. Unit 20)<br>GPS Location: N 21°20.420', E 72°59.272'<br>(L9 - SL9) 40UBF Oil Separator Sump<br>GPS Location: N 21°20.504', E 72°59.325'<br>(L10 - SL10) Switchyard (GIS) Oil Sump<br>GPS Location: N 21°20.592', E 72°59.274'<br>(L11 - SL11) 40UPQ<br>GPS Location: N 21°20.448', E 72°59.471'<br>(L12 - SL12) 40UGD<br>GPS Location: N 21°20.324', E 72°59.387'   |

(L = Location, A = Air, GW = Ground Water, TEW = Treated Effluent Water, SW = Sewage Water, N = Noise, SL = Soil, SM = Stack Monitoring Stations)



## **CHAPTER 2**

### **2.0 RESULTS OF AMBIENT AIR QUALITY MONITORING**

**MONITORING PERIOD: APRIL 2023 TO SEPTEMBER 2023**

## 2.0 AMBIENT AIR QUALITY MONITORING:

### LOCATION DETAILS:

| SR. NO. | MONITORING STATIONS                                 | LANDMARKS           |
|---------|---|---------------------|
| 1       | L1 – A1 (GPS Location: N 21°20.694' , E 72°59.494') | SUKAN BUILDING      |
| 2       | L2 – A2 (GPS Location: N 21°20.639' , E 72°59.144') | SWITCH YARD         |
| 3       | L3 – A3 (GPS Location: N 21°19.777' , E 72°59.056') | SHARDASHISH COLONY  |
| 4       | L4 – A4 (GPS Location: N 21°19.191' , E 72°58.859') | SURBHI (INTEK WELL) |
| 5       | L5 – A5 (GPS Location: N 21°20.072' , E 72°59.498') | AKHAKHOL VILLAGE    |
| 6       | L6 – A6 (GPS Location: N 21°20.014' , E 72°57.624') | NAVI PARDI VILLAGE  |

### DETAIL OF ANALYSIS METHOD:

| SR. NO. | PARAMETERS                                      | UNIT              | METHODOLOGY  | LIMIT# | GPCB Limit*   | Minimum Detection Limit |
|---------|---|-------------------|--|--------|---------------|-------------------------|
| 1       | Particulate Matter (PM <sub>10</sub> )          | µg/m <sup>3</sup> | Gravimetric  | 100    | 100           | < 10                    |
| 2       | Particulate Matter (PM <sub>2.5</sub> )         | µg/m <sup>3</sup> | Gravimetric  | 60     | 60            | < 5.0                   |
| 3       | Lead as Pb                                      | µg/m <sup>3</sup> | AAS Method after sampling on EPM 2000 Filter paper | 1.0    | Not Specified | < 0.1                   |
| 4       | Benzo (a) Pyrene (BaP) - particulate phase only | ng/m <sup>3</sup> | Solvent Extraction followed by GC Analysis         | 1.0    | Not Specified | < 0.5                   |
| 5       | Arsenic as As                                   | ng/m <sup>3</sup> | AAS Method after sampling on EPM 2000 Filter paper | 6.0    | Not Specified | < 2.0                   |
| 6       | Nickel as Ni                                    | ng/m <sup>3</sup> | AAS Method after sampling on EPM 2000 Filter paper | 20     | Not Specified | < 5                     |
| 7       | Carbon Monoxide as CO                           | mg/m <sup>3</sup> | Non Dispersive Infra Red (NDIR)                    | 4.0    | Not Specified | < 0.1                   |
| 8       | Benzene as C <sub>6</sub> H <sub>6</sub>        | µg/m <sup>3</sup> | Gas chromatography based on Continuous Analyser    | 5.0    | Not Specified | < 2.0                   |
| 9       | Ammonia as NH <sub>3</sub>                      | µg/m <sup>3</sup> | Indophenol Blue method                             | 400    | Not Specified | <2.0                    |
| 10      | Sulphur Dioxide as SO <sub>2</sub>              | µg/m <sup>3</sup> | Improved West and Gaeke                            | 80     | 80            | < 6.0                   |
| 11      | Nitrogen Dioxide as NO <sub>2</sub>             | µg/m <sup>3</sup> | Modified Jacob & Hochheiser                        | 80     | 80            | < 6.0                   |
| 12      | Ozone as O <sub>3</sub>                         | µg/m <sup>3</sup> | Chemical Method                                    | 180    | Not Specified | < 5.0                   |

Limit#: Industrial, Residential, Rural and other Area Notification Dated 16<sup>th</sup> Nov.2009 as per National Ambient Air Quality Standards, CPCB New Delhi.  
GPCB Limit\*: As per Consent Order No. AWH-104707 valid up to 05.09.2025.

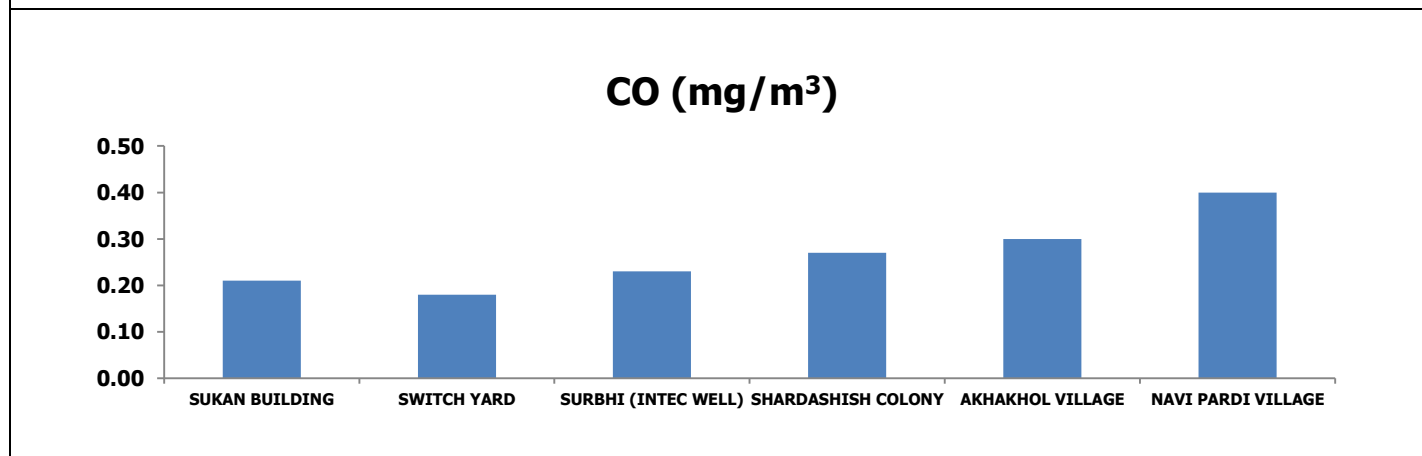
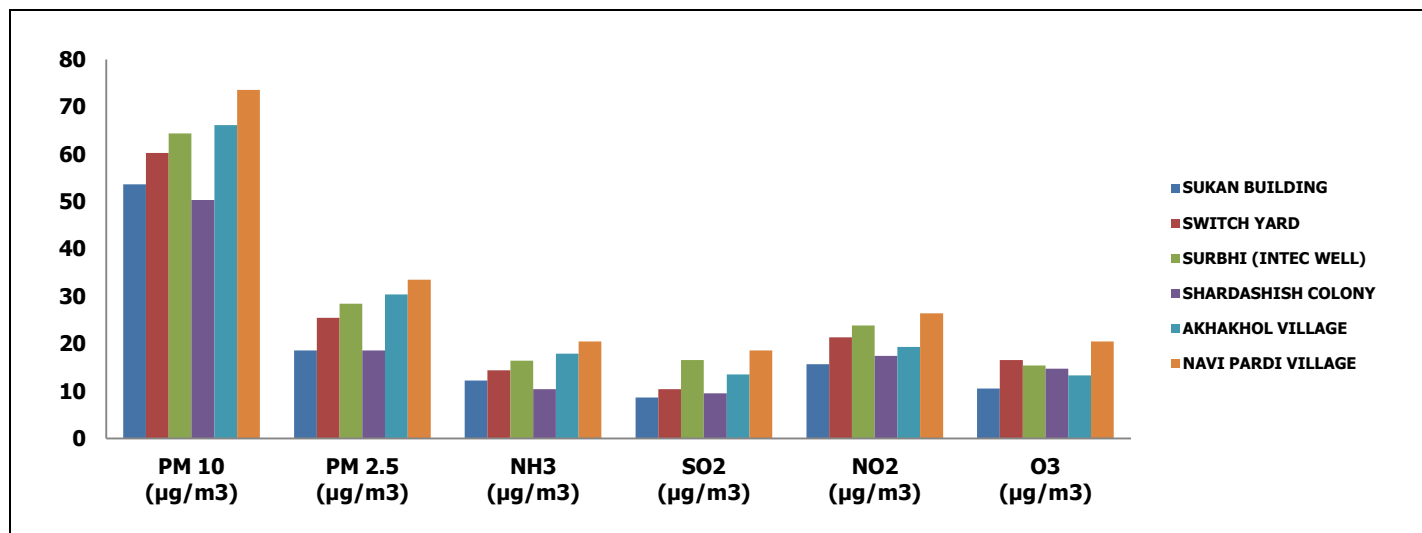


**TABLE 2.1: RESULTS OF AAQM ANALYSIS [APRIL 2023]**

| SR. NO. | TEST PARAMETER                                  | UNIT              | 19/04/23     |              | 19/04/23            |                    | 20/04/23         |                    |
|---------|---|-------------------|--------------|--------------|---------------------|--------------------|------------------|--------------------|
|         |   |                   | SUKAN        | SWITCH YARD  | SURBHI (INTEK WELL) | SHARDASHISH COLONY | AKHAKHOL VILLAGE | NAVI PARDI VILLAGE |
| 1       | Particulate Matter (PM <sub>10</sub> )          | µg/m <sup>3</sup> | 53.62        | 60.22        | 64.36               | 50.34              | 66.12            | 73.58              |
| 2       | Particulate Matter (PM <sub>2.5</sub> )         | µg/m <sup>3</sup> | 18.60        | 25.45        | 28.41               | 18.60              | 30.41            | 33.49              |
| 3       | Lead as Pb                                      | µg/m <sup>3</sup> | Not Detected | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 4       | Benzo (a) Pyrene (BaP) - particulate phase only | ng/m <sup>3</sup> | Not Detected | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 5       | Arsenic as As                                   | ng/m <sup>3</sup> | Not Detected | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 6       | Nickel as Ni                                    | ng/m <sup>3</sup> | Not Detected | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 7       | Carbon Monoxide as CO                           | mg/m <sup>3</sup> | 0.21         | 0.18         | 0.23                | 0.27               | 0.30             | 0.40               |
| 8       | Benzene as C <sub>6</sub> H <sub>6</sub>        | µg/m <sup>3</sup> | Not Detected | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 9       | Ammonia as NH <sub>3</sub>                      | µg/m <sup>3</sup> | 12.24        | 14.36        | 16.42               | 10.42              | 17.86            | 20.46              |
| 10      | Sulphur Dioxide as SO <sub>2</sub>              | µg/m <sup>3</sup> | 8.63         | 10.40        | 16.55               | 9.49               | 13.52            | 18.60              |
| 11      | Nitrogen Dioxide as NO <sub>2</sub>             | µg/m <sup>3</sup> | 15.63        | 21.35        | 23.85               | 17.45              | 19.33            | 26.42              |
| 12      | Ozone as O <sub>3</sub>                         | µg/m <sup>3</sup> | 10.55        | 16.51        | 15.42               | 14.71              | 13.29            | 20.49              |

Detection Limit: Lead as Pb: 0.1 µg/m<sup>3</sup>, Arsenic as As : 2 ng/m<sup>3</sup>, Benzo (a) Pyrene (BaP) - particulate phase only: 0.5 ng/m<sup>3</sup>, Nickel as Ni: 5 ng/m<sup>3</sup>, Benzene as C<sub>6</sub>H<sub>6</sub>: 2 µg/m<sup>3</sup>

**RESULT OF AMBIENT AIR MONITORING GRAPH [APRIL 2023]**



Lead as Pb, Benzo (a) Pyrene (BaP), Nickel as Ni, Arsenic as As, Benzene as C<sub>6</sub>H<sub>6</sub> are below detection limit, not mentioned in graph.

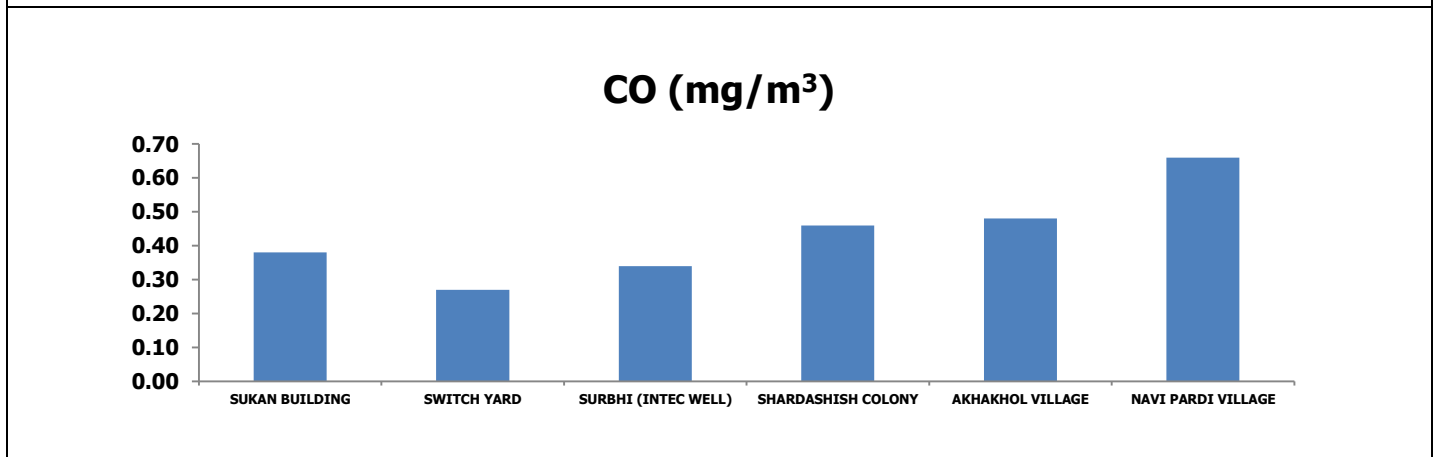
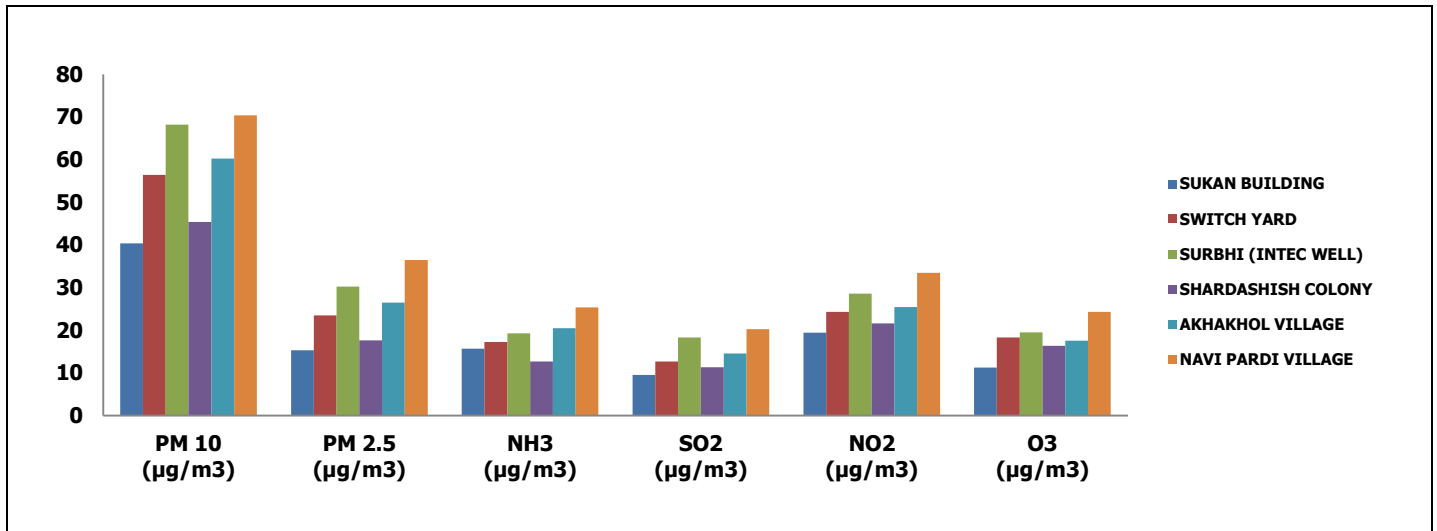


**TABLE 2.2: RESULTS OF AAQM ANALYSIS [MAY 2023]**

| Date of Sampling |   |                   | 15/05/23     | 15/05/23     | 15/05/23            | 15/05/23           | 16/05/23         | 16/05/23           |
|------------------|---|-------------------|--------------|--------------|---------------------|--------------------|------------------|--------------------|
| SR. NO.          | TEST PARAMETER                                  | UNIT              | SUKAN        | SWITCH YARD  | SURBHI (INTEC WELL) | SHARDASHISH COLONY | AKHAKHOL VILLAGE | NAVI PARDI VILLAGE |
| 1                | Particulate Matter (PM <sub>10</sub> )          | µg/m <sup>3</sup> | 40.38        | 56.37        | 68.17               | 45.36              | 60.24            | 70.38              |
| 2                | Particulate Matter (PM <sub>2.5</sub> )         | µg/m <sup>3</sup> | 15.25        | 23.45        | 30.21               | 17.61              | 26.46            | 36.43              |
| 3                | Lead as Pb                                      | µg/m <sup>3</sup> | Not Detected | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 4                | Benzo (a) Pyrene (BaP) - particulate phase only | ng/m <sup>3</sup> | Not Detected | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 5                | Arsenic as As                                   | ng/m <sup>3</sup> | Not Detected | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 6                | Nickel as Ni                                    | ng/m <sup>3</sup> | Not Detected | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 7                | Carbon Monoxide as CO                           | mg/m <sup>3</sup> | 0.25         | 0.23         | 0.27                | 0.34               | 0.39             | 0.48               |
| 8                | Benzene as C <sub>6</sub> H <sub>6</sub>        | µg/m <sup>3</sup> | Not Detected | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 9                | Ammonia as NH <sub>3</sub>                      | µg/m <sup>3</sup> | 15.65        | 17.26        | 19.23               | 12.62              | 20.43            | 25.37              |
| 10               | Sulphur Dioxide as SO <sub>2</sub>              | µg/m <sup>3</sup> | 9.49         | 12.65        | 18.27               | 11.30              | 14.50            | 20.23              |
| 11               | Nitrogen Dioxide as NO <sub>2</sub>             | µg/m <sup>3</sup> | 19.42        | 24.28        | 28.59               | 21.61              | 25.38            | 33.41              |
| 12               | Ozone as O <sub>3</sub>                         | µg/m <sup>3</sup> | 11.22        | 18.26        | 19.45               | 16.36              | 17.56            | 24.29              |

Detection Limit: Lead as Pb: 0.1 µg/m<sup>3</sup>, Arsenic as As : 2 ng/m<sup>3</sup>, Benzo (a) Pyrene (BaP) - particulate phase only: 0.5 ng/m<sup>3</sup>, Nickel as Ni: 5 ng/m<sup>3</sup>, Benzene as C<sub>6</sub>H<sub>6</sub>: 2 µg/m<sup>3</sup>

**RESULT OF AMBIENT AIR MONITORING GRAPH [MAY 2023]**



Lead as Pb, Benzo (a) Pyrene (BaP), Nickel as Ni, Arsenic as As, Benzene as C<sub>6</sub>H<sub>6</sub> are below detection limit, not mentioned in graph.

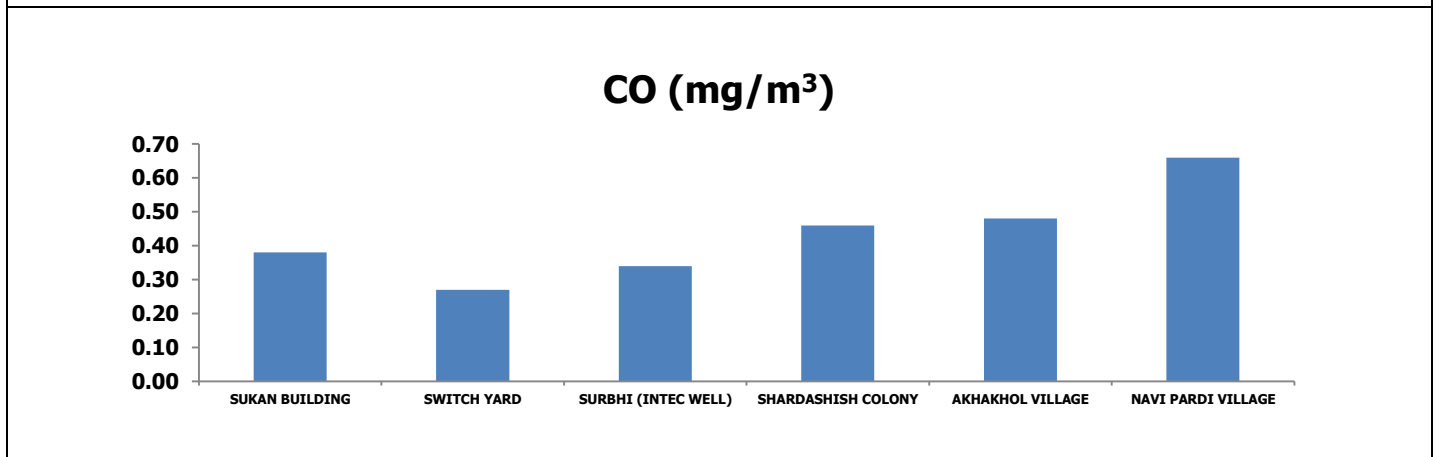
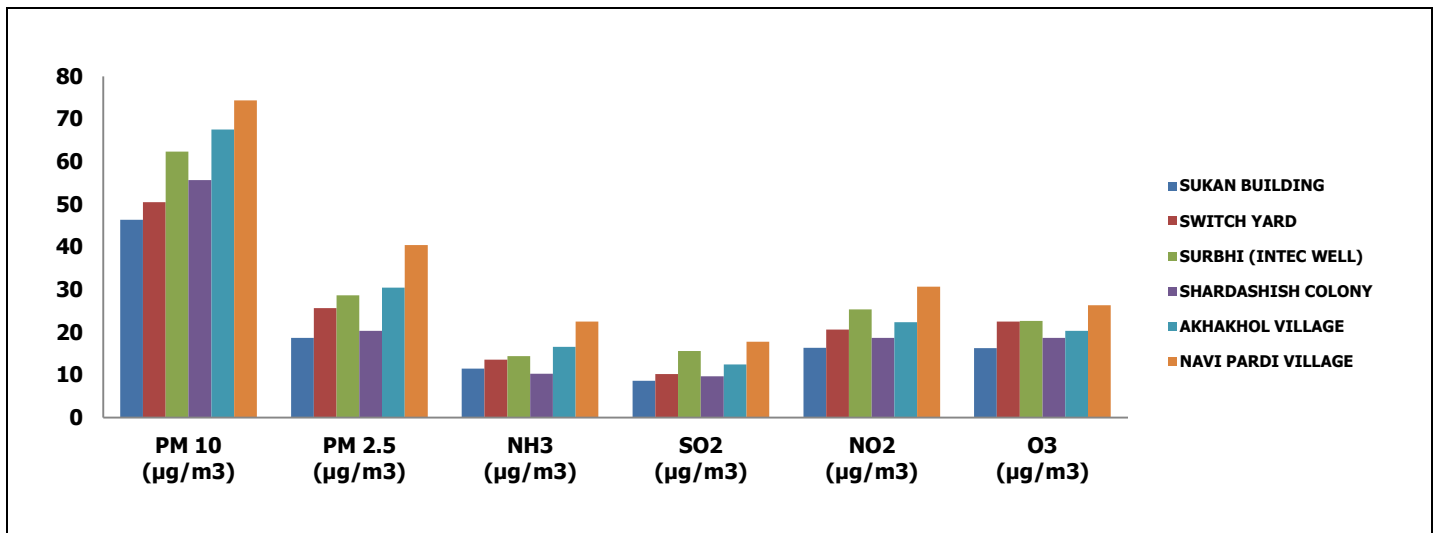


**TABLE 2.3: RESULTS OF AAQM ANALYSIS [JUNE 2023]**

| SR. NO. | TEST PARAMETER                                  | UNIT              | Date of Sampling |              |                     |                    |                  |                    |
|---------|---|-------------------|------------------|--------------|---------------------|--------------------|------------------|--------------------|
|         |   |                   | 21/06/23         | 21/06/23     | 21/06/23            | 21/06/23           | 22/06/23         | 22/06/23           |
|         |   |                   | SUKAN            | SWITCH YARD  | SURBHI (INTEC WELL) | SHARDASHISH COLONY | AKHAKHOL VILLAGE | NAVI PARDI VILLAGE |
| 1       | Particulate Matter (PM <sub>10</sub> )          | µg/m <sup>3</sup> | 46.33            | 50.51        | 62.37               | 55.64              | 67.54            | 74.38              |
| 2       | Particulate Matter (PM <sub>2.5</sub> )         | µg/m <sup>3</sup> | 18.63            | 25.63        | 28.67               | 20.28              | 30.45            | 40.44              |
| 3       | Lead as Pb                                      | µg/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 4       | Benzo (a) Pyrene (BaP) - particulate phase only | ng/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 5       | Arsenic as As                                   | ng/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 6       | Nickel as Ni                                    | ng/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 7       | Carbon Monoxide as CO                           | mg/m <sup>3</sup> | 0.38             | 0.27         | 0.34                | 0.46               | 0.48             | 0.66               |
| 8       | Benzene as C <sub>6</sub> H <sub>6</sub>        | µg/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 9       | Ammonia as NH <sub>3</sub>                      | µg/m <sup>3</sup> | 11.45            | 13.54        | 14.37               | 10.24              | 16.52            | 22.48              |
| 10      | Sulphur Dioxide as SO <sub>2</sub>              | µg/m <sup>3</sup> | 8.63             | 10.19        | 15.60               | 9.66               | 12.44            | 17.79              |
| 11      | Nitrogen Dioxide as NO <sub>2</sub>             | µg/m <sup>3</sup> | 16.33            | 20.63        | 25.32               | 18.65              | 22.34            | 30.66              |
| 12      | Ozone as O <sub>3</sub>                         | µg/m <sup>3</sup> | 16.23            | 22.47        | 22.62               | 18.68              | 20.33            | 26.31              |

Detection Limit: Lead as Pb: 0.1 µg/m<sup>3</sup>, Arsenic as As : 2 ng/m<sup>3</sup>, Benzo (a) Pyrene (BaP) - particulate phase only: 0.5 ng/m<sup>3</sup>, Nickel as Ni: 5 ng/m<sup>3</sup>, Benzene as C<sub>6</sub>H<sub>6</sub>: 2 µg/m<sup>3</sup>

**RESULT OF AMBIENT AIR MONITORING GRAPH [JUNE 2023]**



Lead as Pb, Benzo (a) Pyrene (BaP), Nickel as Ni, Arsenic as As, Benzene as C<sub>6</sub>H<sub>6</sub> are below detection limit, not mentioned in graph.



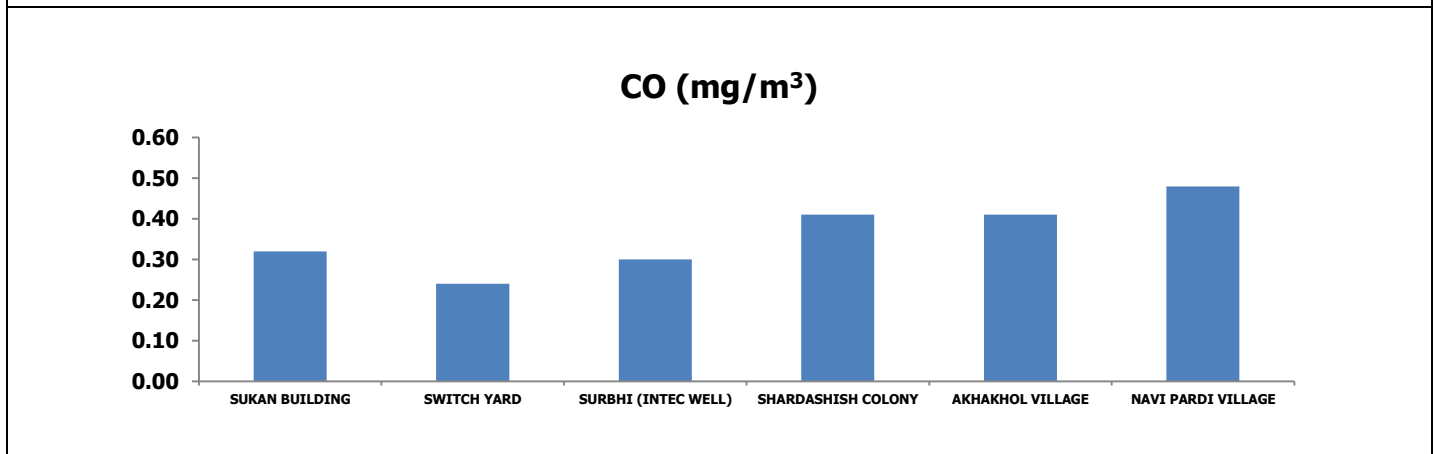
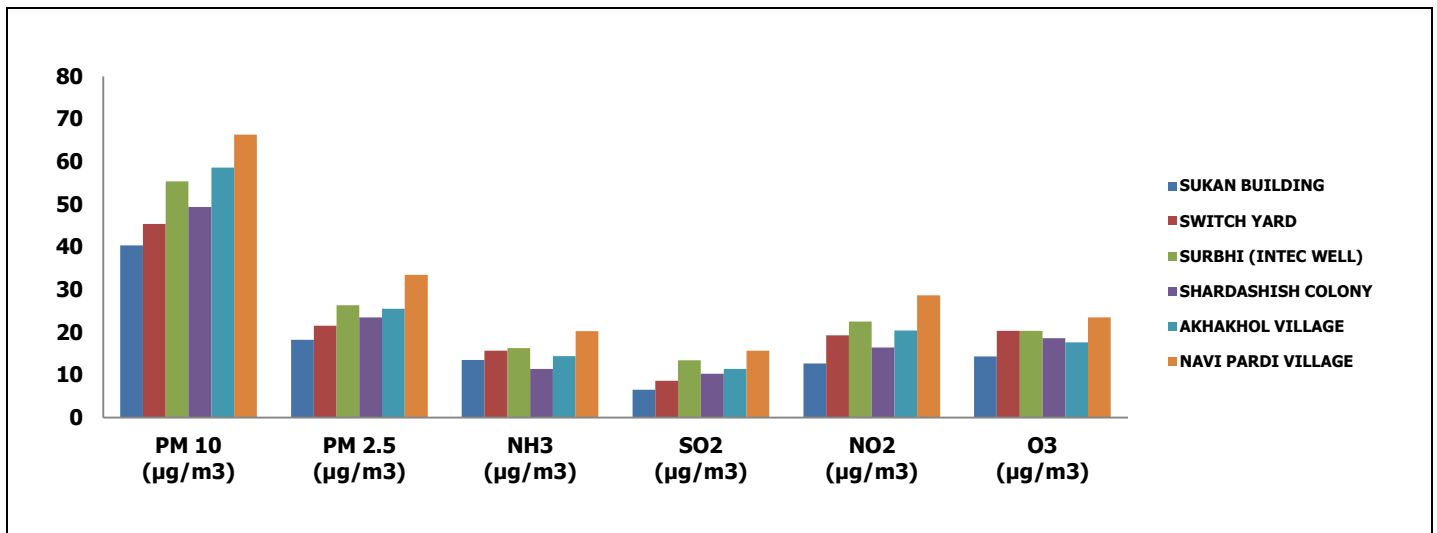


**TABLE 2.4: RESULTS OF AAQM ANALYSIS [JULY 2023]**

| SR. NO. | TEST PARAMETER                                  | UNIT              | Date of Sampling |              |                     |                    |                  |                    |
|---------|---|-------------------|------------------|--------------|---------------------|--------------------|------------------|--------------------|
|         |   |                   | 19/07/23         | 19/07/23     | 19/07/23            | 19/07/23           | 20/07/23         | 20/07/23           |
|         |   |                   | SUKAN            | SWITCH YARD  | SURBHI (INTEC WELL) | SHARDASHISH COLONY | AKHAKHOL VILLAGE | NAVI PARDI VILLAGE |
| 1       | Particulate Matter (PM <sub>10</sub> )          | µg/m <sup>3</sup> | 40.36            | 45.34        | 55.34               | 49.34              | 58.62            | 66.34              |
| 2       | Particulate Matter (PM <sub>2.5</sub> )         | µg/m <sup>3</sup> | 18.23            | 21.50        | 26.32               | 23.46              | 25.49            | 33.43              |
| 3       | Lead as Pb                                      | µg/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 4       | Benzo (a) Pyrene (BaP) - particulate phase only | ng/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 5       | Arsenic as As                                   | ng/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 6       | Nickel as Ni                                    | ng/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 7       | Carbon Monoxide as CO                           | mg/m <sup>3</sup> | 0.32             | 0.24         | 0.30                | 0.41               | 0.41             | 0.48               |
| 8       | Benzene as C <sub>6</sub> H <sub>6</sub>        | µg/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 9       | Ammonia as NH <sub>3</sub>                      | µg/m <sup>3</sup> | 13.46            | 15.66        | 16.24               | 11.34              | 14.34            | 20.22              |
| 10      | Sulphur Dioxide as SO <sub>2</sub>              | µg/m <sup>3</sup> | 6.47             | 8.62         | 13.43               | 10.26              | 11.41            | 15.67              |
| 11      | Nitrogen Dioxide as NO <sub>2</sub>             | µg/m <sup>3</sup> | 12.68            | 19.28        | 22.46               | 16.37              | 20.35            | 28.65              |
| 12      | Ozone as O <sub>3</sub>                         | µg/m <sup>3</sup> | 14.27            | 20.34        | 20.33               | 18.55              | 17.58            | 23.44              |

Detection Limit: Lead as Pb: 0.1 µg/m<sup>3</sup>, Arsenic as As : 2 ng/m<sup>3</sup>, Benzo (a) Pyrene (BaP) - particulate phase only: 0.5 ng/m<sup>3</sup>, Nickel as Ni: 5 ng/m<sup>3</sup>, Benzene as C<sub>6</sub>H<sub>6</sub>: 2 µg/m<sup>3</sup>

**RESULT OF AMBIENT AIR MONITORING GRAPH [JULY 2023]**



Lead as Pb, Benzo (a) Pyrene (BaP), Nickel as Ni, Arsenic as As, Benzene as C<sub>6</sub>H<sub>6</sub> are below detection limit, not mentioned in graph.

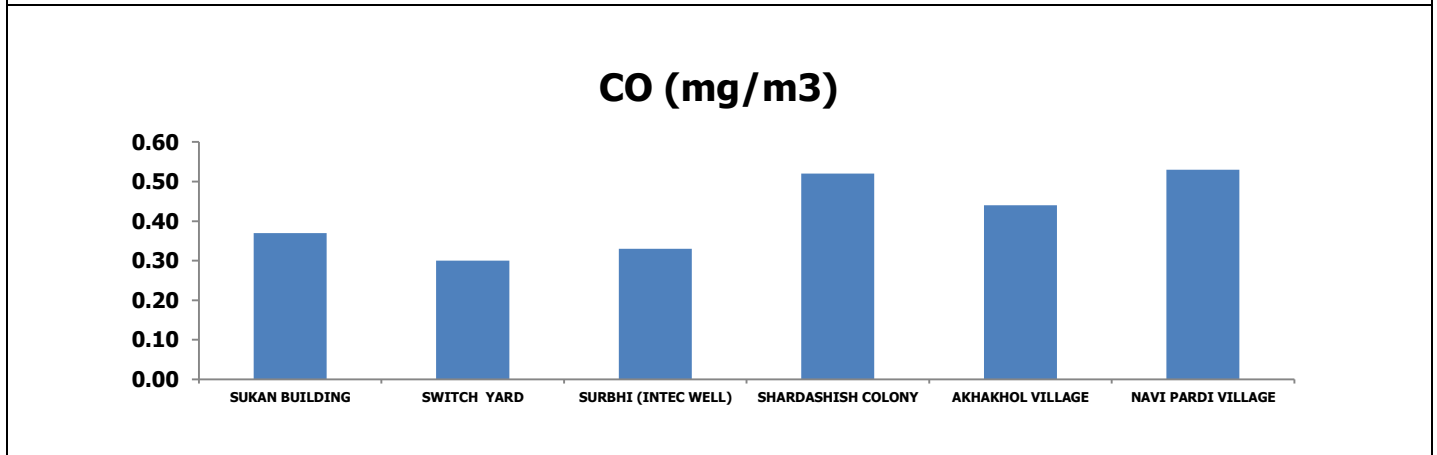
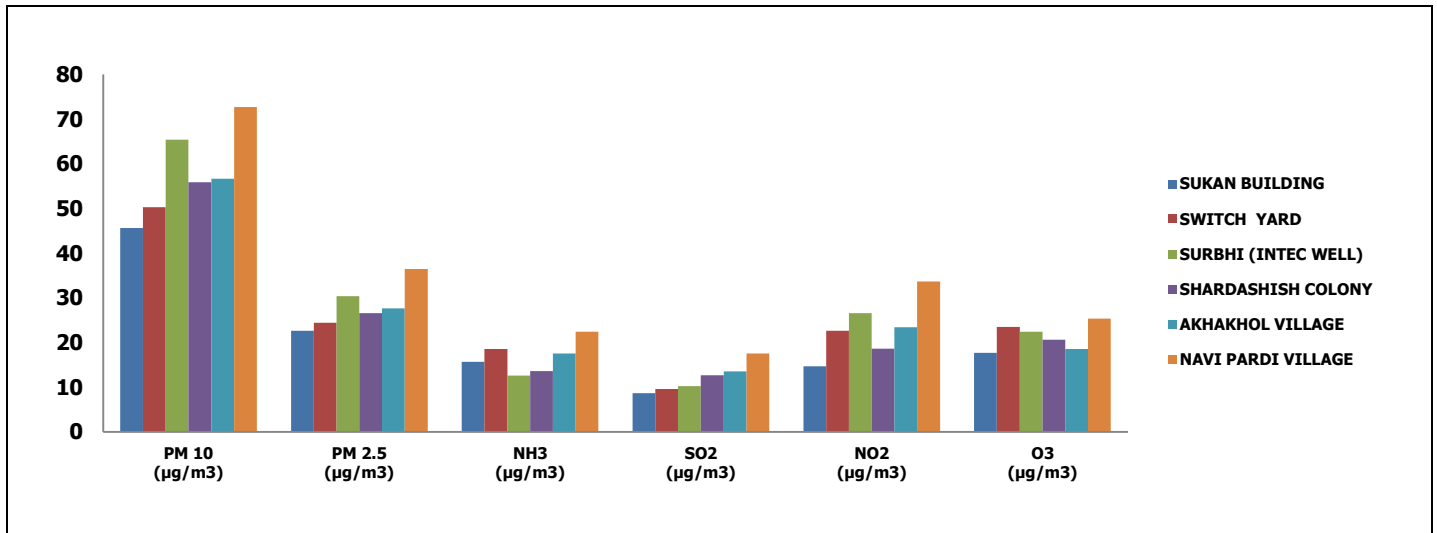


**TABLE 2.5: RESULTS OF AAQM ANALYSIS [AUGUST 2023]**

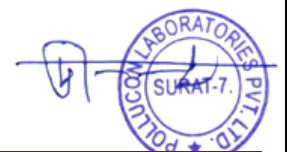
| SR. NO. | TEST PARAMETER                                  | UNIT              | Date of Sampling |              |                     |                    |                  |                    |
|---------|---|-------------------|------------------|--------------|---------------------|--------------------|------------------|--------------------|
|         |   |                   | 08/08/23         | 08/08/23     | 08/08/23            | 08/08/23           | 09/08/23         | 09/08/23           |
|         |   |                   | SUKAN            | SWITCH YARD  | SURBHI (INTEC WELL) | SHARDASHISH COLONY | AKHAKHOL VILLAGE | NAVI PARDI VILLAGE |
| 1       | Particulate Matter (PM <sub>10</sub> )          | µg/m <sup>3</sup> | 45.62            | 50.23        | 65.37               | 55.81              | 56.66            | 72.64              |
| 2       | Particulate Matter (PM <sub>2.5</sub> )         | µg/m <sup>3</sup> | 22.65            | 24.37        | 30.34               | 26.55              | 27.65            | 36.43              |
| 3       | Lead as Pb                                      | µg/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 4       | Benzo (a) Pyrene (BaP) - particulate phase only | ng/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 5       | Arsenic as As                                   | ng/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 6       | Nickel as Ni                                    | ng/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 7       | Carbon Monoxide as CO                           | mg/m <sup>3</sup> | 0.37             | 0.30         | 0.33                | 0.52               | 0.44             | 0.53               |
| 8       | Benzene as C <sub>6</sub> H <sub>6</sub>        | µg/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 9       | Ammonia as NH <sub>3</sub>                      | µg/m <sup>3</sup> | 15.68            | 18.52        | 12.62               | 13.62              | 17.54            | 22.38              |
| 10      | Sulphur Dioxide as SO <sub>2</sub>              | µg/m <sup>3</sup> | 8.65             | 9.55         | 10.26               | 12.63              | 13.51            | 17.56              |
| 11      | Nitrogen Dioxide as NO <sub>2</sub>             | µg/m <sup>3</sup> | 14.64            | 22.62        | 26.54               | 18.57              | 23.43            | 33.66              |
| 12      | Ozone as O <sub>3</sub>                         | µg/m <sup>3</sup> | 17.64            | 23.46        | 22.42               | 20.62              | 18.53            | 25.32              |

Detection Limit: Lead as Pb: 0.1 µg/m<sup>3</sup>, Arsenic as As : 2 ng/m<sup>3</sup>, Benzo (a) Pyrene (BaP) - particulate phase only: 0.5 ng/m<sup>3</sup>, Nickel as Ni: 5 ng/m<sup>3</sup>, Benzene as C<sub>6</sub>H<sub>6</sub>: 2 µg/m<sup>3</sup>

**RESULT OF AMBIENT AIR MONITORING GRAPH [AUGUST 2023]**



Lead as Pb, Benzo (a) Pyrene (BaP), Nickel as Ni, Arsenic as As, Benzene as C<sub>6</sub>H<sub>6</sub> are below detection limit, not mentioned in graph.

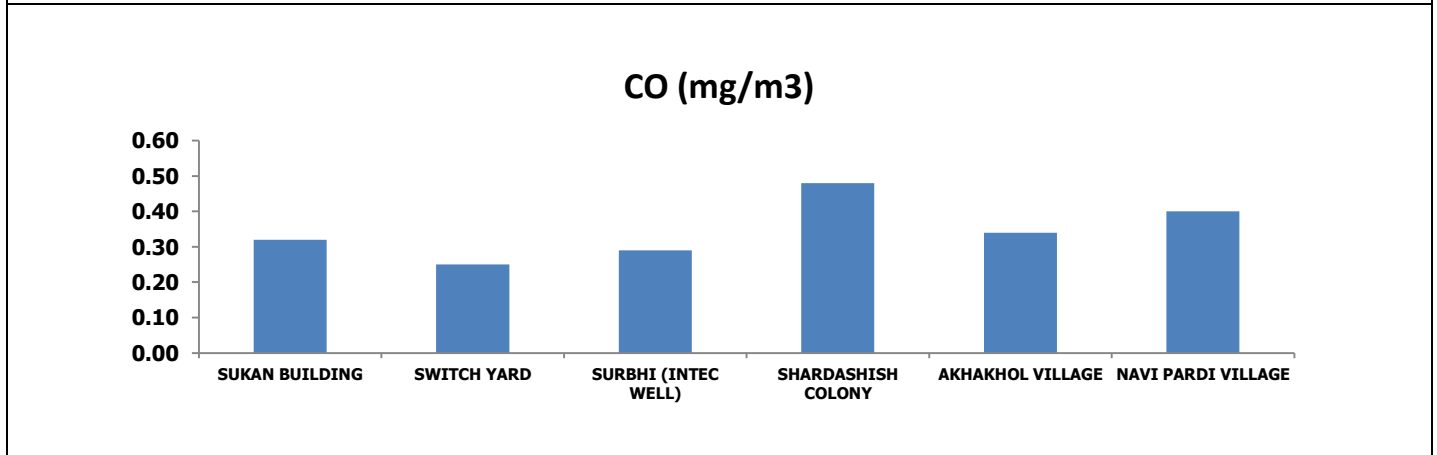
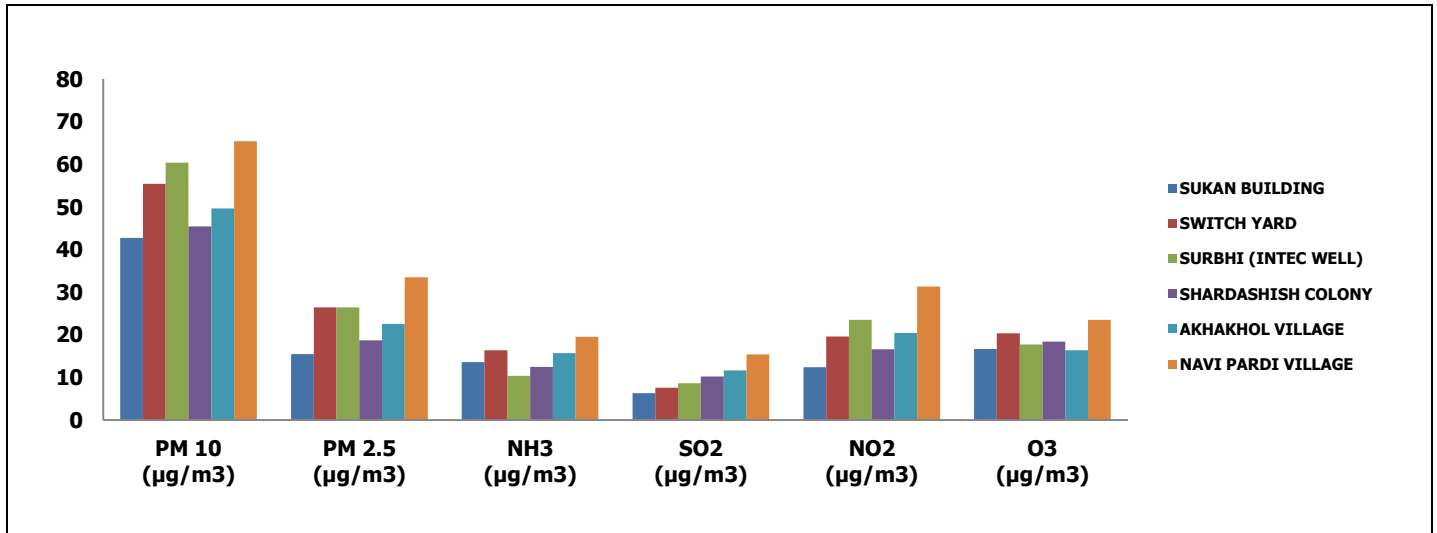


**TABLE 2.6: RESULTS OF AAQM ANALYSIS [SEPTEMBER 2023]**

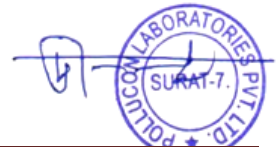
| SR. NO. | TEST PARAMETER                                  | UNIT              | Date of Sampling |              |                     |                    |                  |                    |
|---------|---|-------------------|------------------|--------------|---------------------|--------------------|------------------|--------------------|
|         |   |                   | 15/09/23         | 15/09/23     | 15/09/23            | 15/09/23           | 16/09/23         | 16/09/23           |
|         |   |                   | SUKAN            | SWITCH YARD  | SURBHI (INTEC WELL) | SHARDASHISH COLONY | AKHAKHOL VILLAGE | NAVI PARDI VILLAGE |
| 1       | Particulate Matter (PM <sub>10</sub> )          | µg/m <sup>3</sup> | 42.66            | 55.36        | 60.32               | 45.34              | 49.54            | 65.34              |
| 2       | Particulate Matter (PM <sub>2.5</sub> )         | µg/m <sup>3</sup> | 15.43            | 26.41        | 26.40               | 18.66              | 22.47            | 33.41              |
| 3       | Lead as Pb                                      | µg/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 4       | Benzo (a) Pyrene (BaP) - particulate phase only | ng/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 5       | Arsenic as As                                   | ng/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 6       | Nickel as Ni                                    | ng/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 7       | Carbon Monoxide as CO                           | mg/m <sup>3</sup> | 0.32             | 0.25         | 0.29                | 0.48               | 0.34             | 0.40               |
| 8       | Benzene as C <sub>6</sub> H <sub>6</sub>        | µg/m <sup>3</sup> | Not Detected     | Not Detected | Not Detected        | Not Detected       | Not Detected     | Not Detected       |
| 9       | Ammonia as NH <sub>3</sub>                      | µg/m <sup>3</sup> | 13.56            | 16.36        | 10.32               | 12.46              | 15.64            | 19.46              |
| 10      | Sulphur Dioxide as SO <sub>2</sub>              | µg/m <sup>3</sup> | 6.28             | 7.53         | 8.63                | 10.19              | 11.58            | 15.33              |
| 11      | Nitrogen Dioxide as NO <sub>2</sub>             | µg/m <sup>3</sup> | 12.32            | 19.56        | 23.48               | 16.52              | 20.37            | 31.25              |
| 12      | Ozone as O <sub>3</sub>                         | µg/m <sup>3</sup> | 16.59            | 20.27        | 17.65               | 18.36              | 16.29            | 23.46              |

Detection Limit: Lead as Pb: 0.1 µg/m<sup>3</sup>, Arsenic as As : 2 ng/m<sup>3</sup>, Benzo (a) Pyrene (BaP) - particulate phase only: 0.5 ng/m<sup>3</sup>, Nickel as Ni: 5 ng/m<sup>3</sup>, Benzene as C<sub>6</sub>H<sub>6</sub>: 2 µg/m<sup>3</sup>

**RESULT OF AMBIENT AIR MONITORING GRAPH [SEPTEMBER 2023]**



Lead as Pb, Benzo (a) Pyrene (BaP), Nickel as Ni, Arsenic as As, Benzene as C<sub>6</sub>H<sub>6</sub> are below detection limit, not mentioned in graph.



## **CHAPTER 3**

### **3.0 RESULTS OF GROUND WATER QUALITY MONITORING**

**MONITORING PERIOD: APRIL 2023 TO SEPTEMBER 2023**

### 3.0 GROUND WATER QUALITY MONITORING:

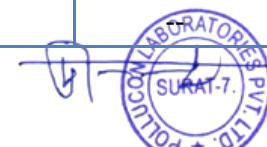
#### MONITORING DETAILS [APRIL 2023 TO SEPTEMBER 2023]

| SR. NO. | MONITORING STATIONS                                       | LANDMARKS                        |
|---------|---|----------------------------------|
| 1       | <b>(L1-GW1)</b> GPS Location: N 21°20.150' E 72° 59.497'  | AKHAKHOL VILLAGE (UP STREAM)     |
| 2       | <b>(L2-GW2)</b> GPS Location: N 21°19.914' E 072° 57.583' | NAVI PARDI VILLAGE (DOWN STREAM) |

#### DETAILS OF ANALYSIS METHOD:

| SR. NO. | PARAMETERS                              | UNIT  | METHOD ADOPTED   | PERMISSIBLE LIMIT IN THE ABSENCE OF ALTERNATE SOURCE AS PER IS:10500 2012 | MINIMUM DETECTABLE LIMIT |
|---------|---|-------|--|---|--------------------------|
| 1       | pH                                      | --    | IS 3025 (Part – 11)<br>Electrometric Method                      | 6.5 to 8.5 <sup>#</sup>   | 2                        |
| 2       | Temperature                             | °C    | IS-3025(Part-9)  | NS*   | 2                        |
| 3       | Turbidity                               | NTU   | APHA (23 <sup>rd</sup> Edition) 2130 B                           | Max 5   | 0.02                     |
| 4       | Conductivity                            | µs/cm | IS 3025 (Part – 14)  | NS*   | 2                        |
| 5       | Total Dissolved Solids                  | mg/L  | IS 3025 (Part-16)  | Max 2000  | 10                       |
| 6       | Total Suspended Solids                  | mg/L  | IS 3025 (Part – 17)  | NS*   | 2.0                      |
| 7       | Alkalinity                              | mg/L  | IS 3025 (Part – 23)  | Max 600   | 2.0                      |
| 8       | Total Hardness                          | mg/L  | IS 3025 (Part – 21)<br>EDTA Method                               | Max 600   | 2.0                      |
| 9       | Ca Hardness as Ca                       | mg/L  | IS 3025 (Part – 40)  | NS*   | 1.0                      |
| 10      | Mg Hardness as Mg                       | mg/L  | IS 3025 (Part – 46)  | Max 100   | 1.0                      |
| 11      | Chloride as Cl                          | mg/L  | IS3025(Part-32)<br>Argentometric Method                          | Max 1000  | 1.0                      |
| 12      | Nitrate as NO <sub>3</sub>              | mg/L  | IS3025(Part-34)<br>Chromotopic Acid Method                       | Max 45 <sup>#</sup>   | 0.5                      |
| 13      | Sulphate as SO <sub>4</sub>             | mg/L  | IS 14543 IS 3025(P-24)   | Max 400   | 1.0                      |
| 14      | Iron as Fe                              | mg/L  | APHA (23 <sup>rd</sup> Edition) 3111 B                           | Max 0.3 <sup>#</sup>  | 0.3                      |
| 15      | Mercury as Hg                           | mg/L  | APHA (23 <sup>rd</sup> Edition) 3112 B                           | Max 0.001 <sup>#</sup>  | 0.006                    |
| 16      | Cadmium as Cd                           | mg/L  | APHA (23 <sup>rd</sup> Edition) 3111 B                           | Max 0.003 <sup>#</sup>  | 0.002                    |
| 17      | Selenium as Se                          | mg/L  | APHA (23 <sup>rd</sup> Edition) 3114 B                           | Max 0.01 <sup>#</sup>   | 0.002                    |
| 18      | Arsenic as As                           | mg/L  | APHA (23 <sup>rd</sup> Edition) 3114 B                           | Max 0.05  | 0.005                    |
| 19      | Cyanide as CN                           | mg/L  | APHA (23 <sup>rd</sup> Edition) 4500 CN E<br>Colorimetric Method | Max 0.05 <sup>#</sup>   | 0.001                    |
| 20      | Lead as Pb                              | mg/L  | APHA (23 <sup>rd</sup> Edition) 3111 B                           | Max 0.01 <sup>#</sup>   | 0.005                    |
| 21      | Zinc as Zn                              | mg/L  | APHA (23 <sup>rd</sup> Edition) 3111 B                           | Max 15  | 0.06                     |
| 22      | Hexavalent Chromium as Cr <sup>+6</sup> | mg/L  | APHA (23 <sup>rd</sup> Edition) 3500 Cr B<br>Colorimetric Method | Max 0.05 <sup>#</sup>   | 0.05                     |
| 23      | Water Table (Depth)                     | meter | --   | --  |                          |

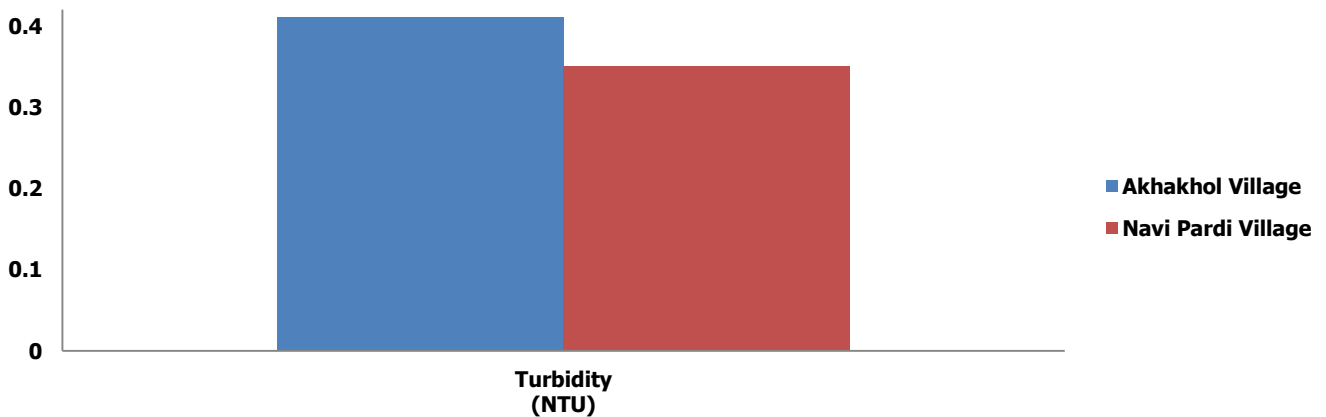
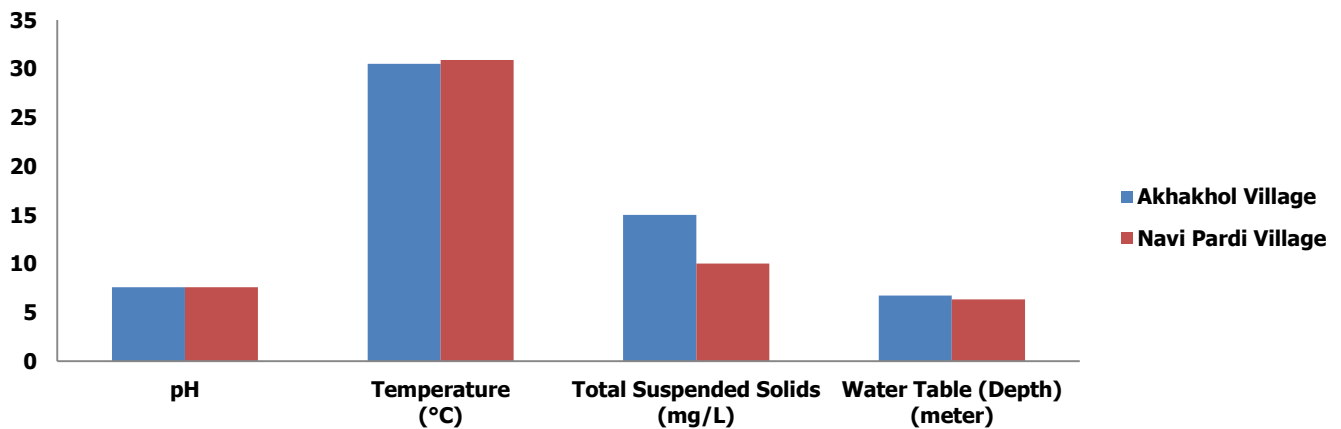
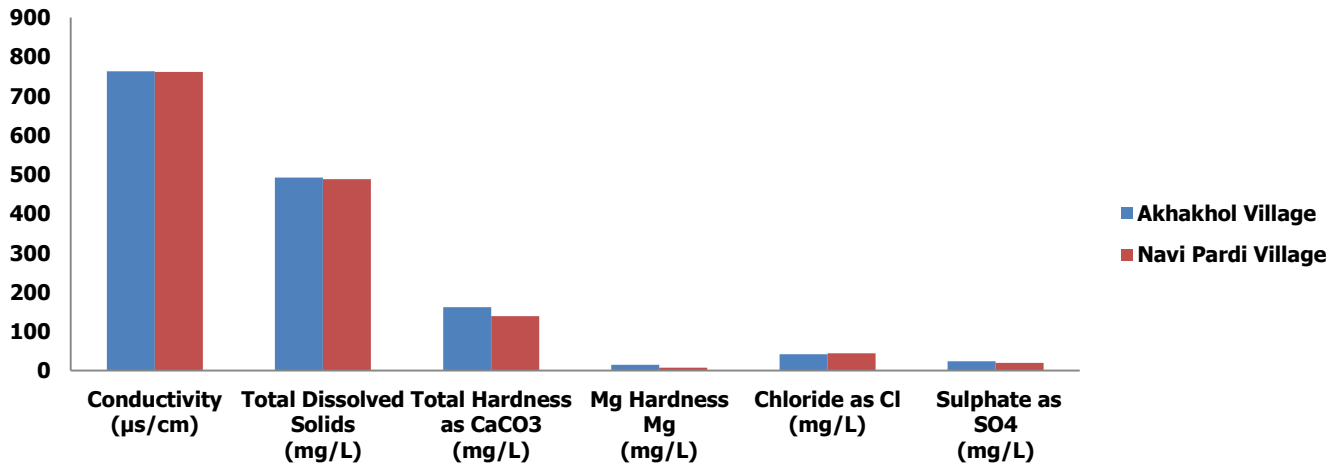
NS\*: Not Specified, # Acceptable Limit as per IS: 10500 2012



**TABLE 3.1 RESULT OF GROUND WATER [APRIL 2023]**

| Date of Sampling |   |       | 20/04/2023       | 20/04/2023         |
|------------------|---|-------|------------------|--------------------|
| SR. NO.          | PARAMETERS                              | UNIT  | AKHAKHOL VILLAGE | NAVI PARDI VILLAGE |
| 1                | pH                                      | --    | 7.57             | 7.56               |
| 2                | Temperature                             | °C    | 30.5             | 30.9               |
| 3                | Turbidity                               | NTU   | 0.41             | 0.35               |
| 4                | Conductivity                            | µs/cm | 763              | 761                |
| 5                | Total Dissolved Solids                  | mg/L  | 492              | 488                |
| 6                | Total Suspended Solids                  | mg/L  | 15               | 10                 |
| 7                | Alkalinity                              | mg/L  | 98               | 116                |
| 8                | Total Hardness                          | mg/L  | 162              | 139                |
| 9                | Ca Hardness as Ca                       | mg/L  | 39.2             | 42.4               |
| 10               | Mg Hardness as Mg                       | mg/L  | 15.36            | 7.92               |
| 11               | Chloride as Cl                          | mg/L  | 41.99            | 43.99              |
| 12               | Nitrate as NO3                          | mg/L  | Not Detected     | Not Detected       |
| 13               | Sulphate as SO4                         | mg/L  | 24.25            | 19.79              |
| 14               | Iron as Fe                              | mg/L  | Not Detected     | Not Detected       |
| 15               | Mercury as Hg                           | mg/L  | Not Detected     | Not Detected       |
| 16               | Cadmium as Cd                           | mg/L  | Not Detected     | Not Detected       |
| 17               | Selenium as Se                          | mg/L  | Not Detected     | Not Detected       |
| 18               | Arsenic as As                           | mg/L  | Not Detected     | Not Detected       |
| 19               | Cyanide as CN                           | mg/L  | Not Detected     | Not Detected       |
| 20               | Lead as Pb                              | mg/L  | Not Detected     | Not Detected       |
| 21               | Zinc as Zn                              | mg/L  | Not Detected     | Not Detected       |
| 22               | Hexavalent Chromium as Cr <sup>+6</sup> | mg/L  | Not Detected     | Not Detected       |
| 23               | Water Table (Depth)                     | meter | 6.70             | 6.32               |

**ANALYSIS RESULTS OF GROUND WATER [APRIL 2023]**



NS\*: Not Specified

Detection Limit(in mg/L): Nitrate:0.5, Iron:0.1,Mercury as Hg:0.005, Cadmium as Cd :0.002, Selenium as Se:0.002, Arsenic as As:0.005, Cyanide as CN:0.001, Lead as Pb:0.005, Zinc:0.06, Hexavalent Chromium as Cr<sup>+6</sup>:0.05 - Not mentioned in graph.

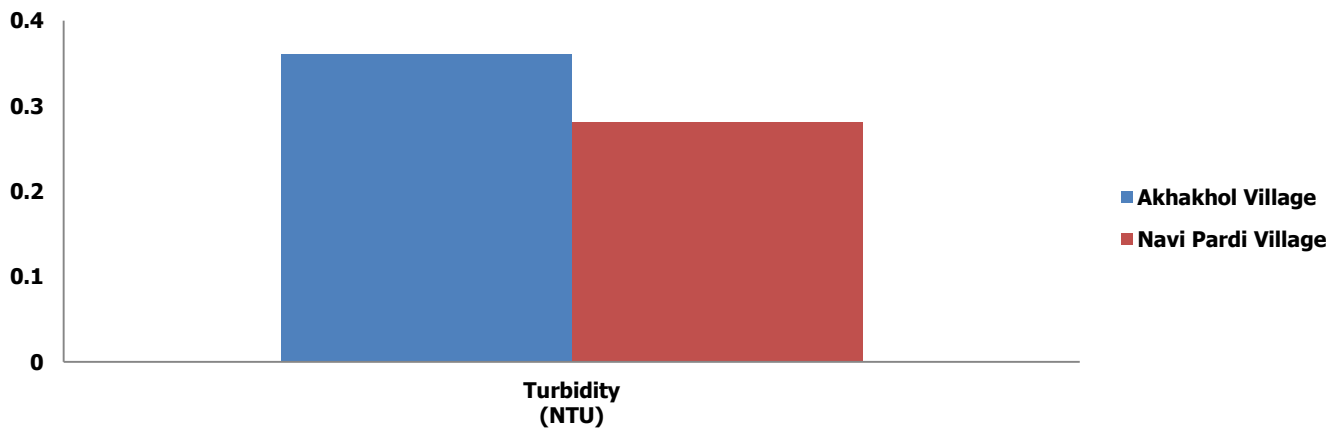
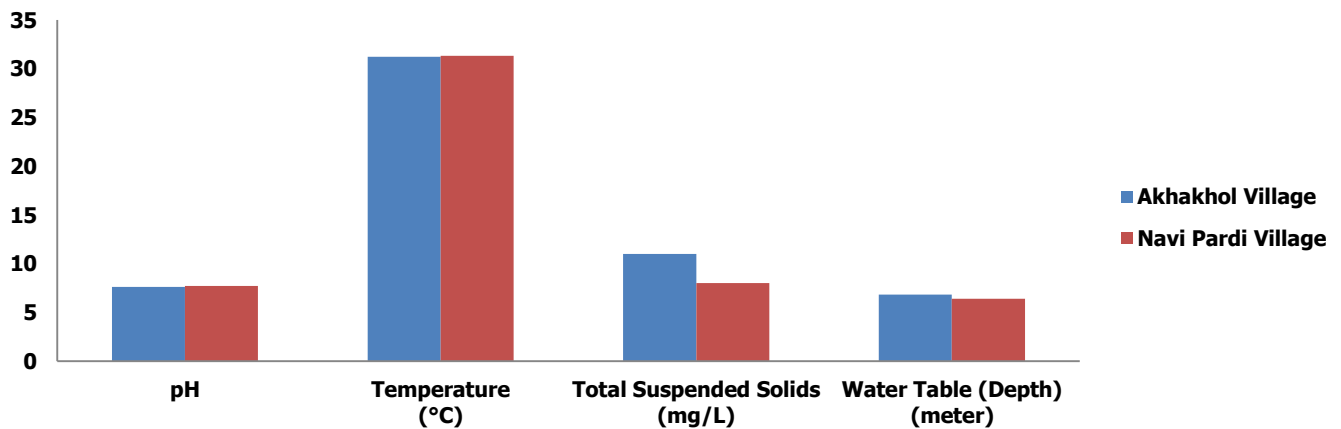
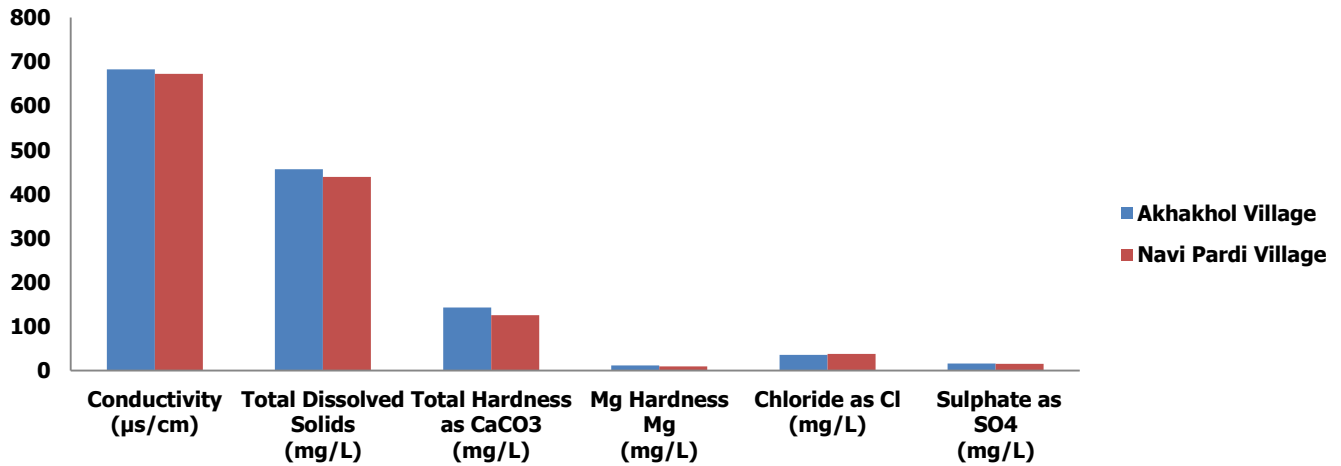


**TABLE 3.2 RESULT OF GROUND WATER [MAY 2023]**

| Date of Sampling |   |       | 15/05/2023       | 15/05/2023         |
|------------------|---|-------|------------------|--------------------|
| SR. NO.          | PARAMETERS                              | UNIT  | AKHAKHOL VILLAGE | NAVI PARDI VILLAGE |
| 1                | pH                                      | --    | 7.59             | 7.7                |
| 2                | Temperature                             | °C    | 31.2             | 31.3               |
| 3                | Turbidity                               | NTU   | 0.36             | 0.28               |
| 4                | Conductivity                            | µs/cm | 682              | 672                |
| 5                | Total Dissolved Solids                  | mg/L  | 456              | 439                |
| 6                | Total Suspended Solids                  | mg/L  | 11               | 8                  |
| 7                | Alkalinity                              | mg/L  | 206              | 204                |
| 8                | Total Hardness                          | mg/L  | 143              | 126                |
| 9                | Ca Hardness as Ca                       | mg/L  | 36.8             | 34.8               |
| 10               | Mg Hardness as Mg                       | mg/L  | 12.24            | 9.36               |
| 11               | Chloride as Cl                          | mg/L  | 35.98            | 37.98              |
| 12               | Nitrate as NO <sub>3</sub>              | mg/L  | Not Detected     | Not Detected       |
| 13               | Sulphate as SO <sub>4</sub>             | mg/L  | 16.37            | 15.83              |
| 14               | Iron as Fe                              | mg/L  | Not Detected     | Not Detected       |
| 15               | Mercury as Hg                           | mg/L  | Not Detected     | Not Detected       |
| 16               | Cadmium as Cd                           | mg/L  | Not Detected     | Not Detected       |
| 17               | Selenium as Se                          | mg/L  | Not Detected     | Not Detected       |
| 18               | Arsenic as As                           | mg/L  | Not Detected     | Not Detected       |
| 19               | Cyanide as CN                           | mg/L  | Not Detected     | Not Detected       |
| 20               | Lead as Pb                              | mg/L  | Not Detected     | Not Detected       |
| 21               | Zinc as Zn                              | mg/L  | Not Detected     | Not Detected       |
| 22               | Hexavalent Chromium as Cr <sup>+6</sup> | mg/L  | Not Detected     | Not Detected       |
| 23               | Water Table (Depth)                     | meter | 6.80             | 6.40               |



**ANALYSIS RESULTS OF GROUND WATER [MAY 2023]**



NS\*: Not Specified

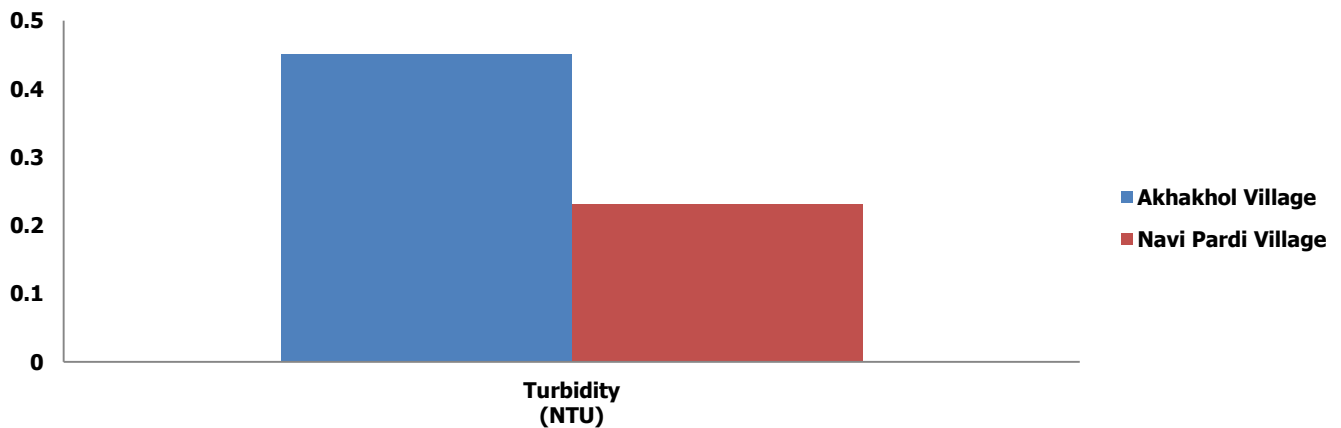
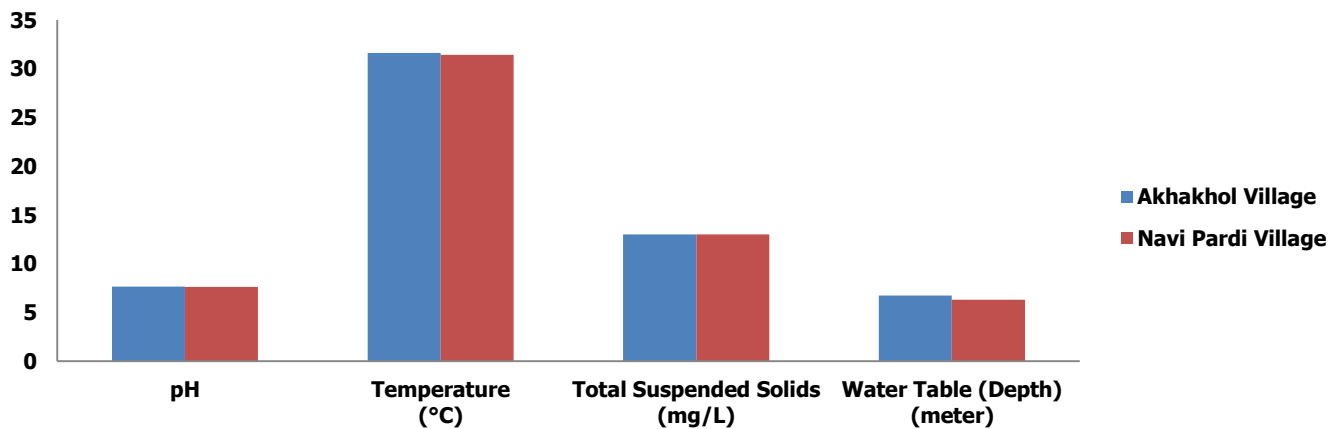
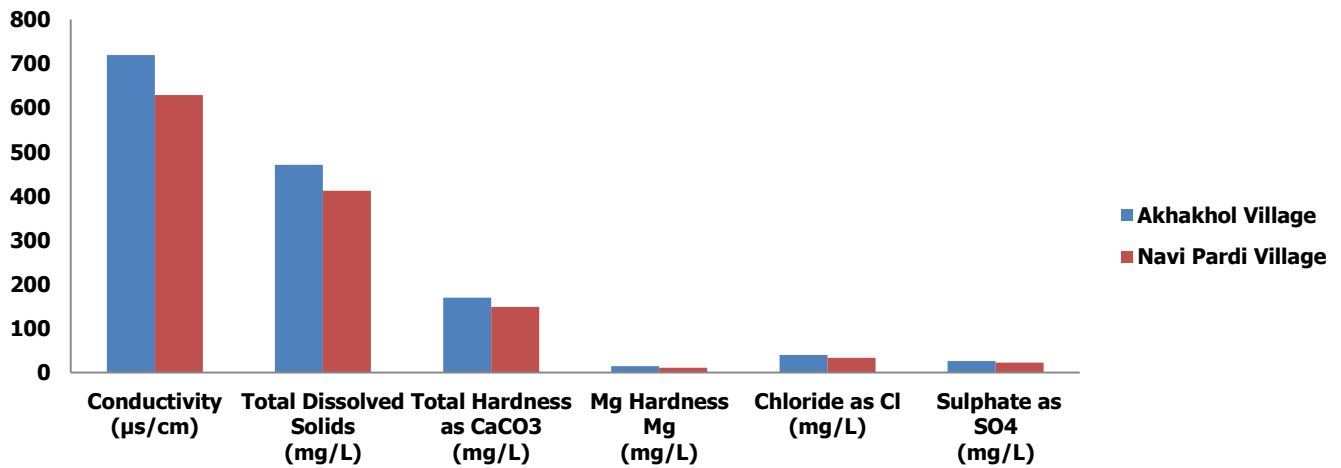
Detection Limit(in mg/L): Nitrate:0.5, Iron:0.1,Mercury as Hg:0.005, Cadmium as Cd :0.002, Selenium as Se:0.002, Arsenic as As:0.005, Cyanide as CN:0.001, Lead as Pb:0.005, Zinc:0.06, Hexavalent Chromium as Cr<sup>+6</sup>:0.05 - Not mentioned in graph.



**TABLE 3.3 RESULT OF GROUND WATER [JUNE 2023]**

| Date of Sampling |   |       | 22/06/2023       | 22/06/2023         |
|------------------|---|-------|------------------|--------------------|
| SR. NO.          | PARAMETERS                              | UNIT  | AKHAKHOL VILLAGE | NAVI PARDI VILLAGE |
| 1                | pH                                      | --    | 7.65             | 7.61               |
| 2                | Temperature                             | °C    | 31.6             | 31.4               |
| 3                | Turbidity                               | NTU   | 0.45             | 0.23               |
| 4                | Conductivity                            | µs/cm | 719              | 629                |
| 5                | Total Dissolved Solids                  | mg/L  | 471              | 412                |
| 6                | Total Suspended Solids                  | mg/L  | 13               | 13                 |
| 7                | Alkalinity                              | mg/L  | 162              | 156                |
| 8                | Total Hardness                          | mg/L  | 170              | 149                |
| 9                | Ca Hardness as Ca                       | mg/L  | 42.8             | 40.4               |
| 10               | Mg Hardness as Mg                       | mg/L  | 15.12            | 11.52              |
| 11               | Chloride as Cl                          | mg/L  | 39.98            | 33.98              |
| 12               | Nitrate as NO <sub>3</sub>              | mg/L  | Not Detected     | Not Detected       |
| 13               | Sulphate as SO <sub>4</sub>             | mg/L  | 26.37            | 22.56              |
| 14               | Iron as Fe                              | mg/L  | Not Detected     | Not Detected       |
| 15               | Mercury as Hg                           | mg/L  | Not Detected     | Not Detected       |
| 16               | Cadmium as Cd                           | mg/L  | Not Detected     | Not Detected       |
| 17               | Selenium as Se                          | mg/L  | Not Detected     | Not Detected       |
| 18               | Arsenic as As                           | mg/L  | Not Detected     | Not Detected       |
| 19               | Cyanide as CN                           | mg/L  | Not Detected     | Not Detected       |
| 20               | Lead as Pb                              | mg/L  | Not Detected     | Not Detected       |
| 21               | Zinc as Zn                              | mg/L  | Not Detected     | Not Detected       |
| 22               | Hexavalent Chromium as Cr <sup>+6</sup> | mg/L  | Not Detected     | Not Detected       |
| 23               | Water Table (Depth)                     | meter | 6.70             | 6.30               |

**ANALYSIS RESULTS OF GROUND WATER [JUNE 2023]**



NS\*: Not Specified

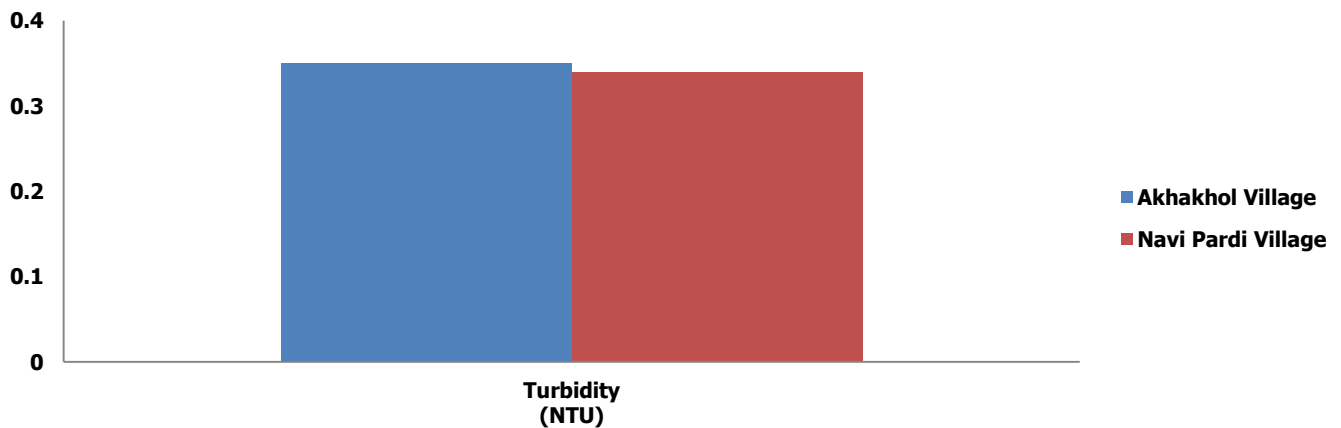
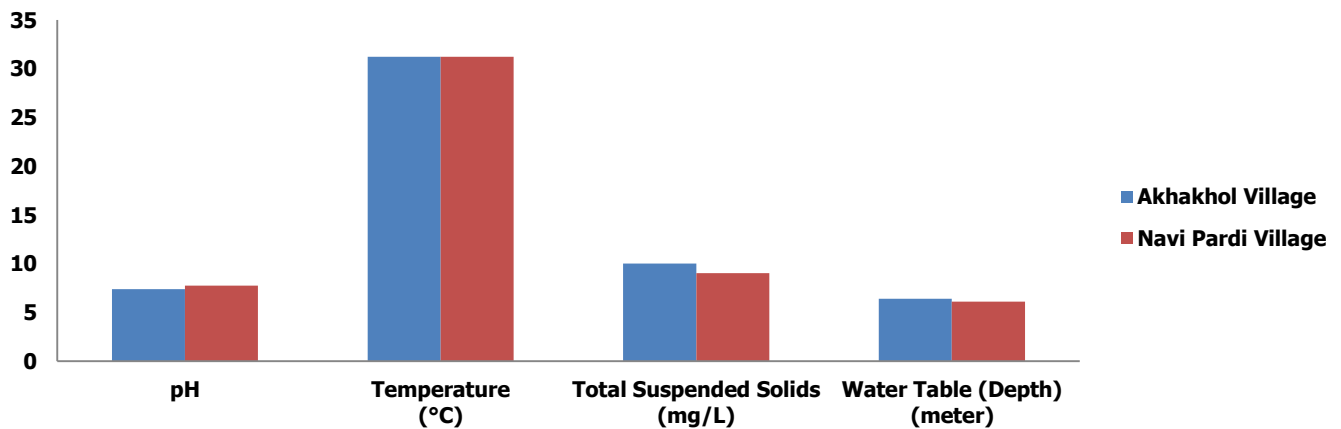
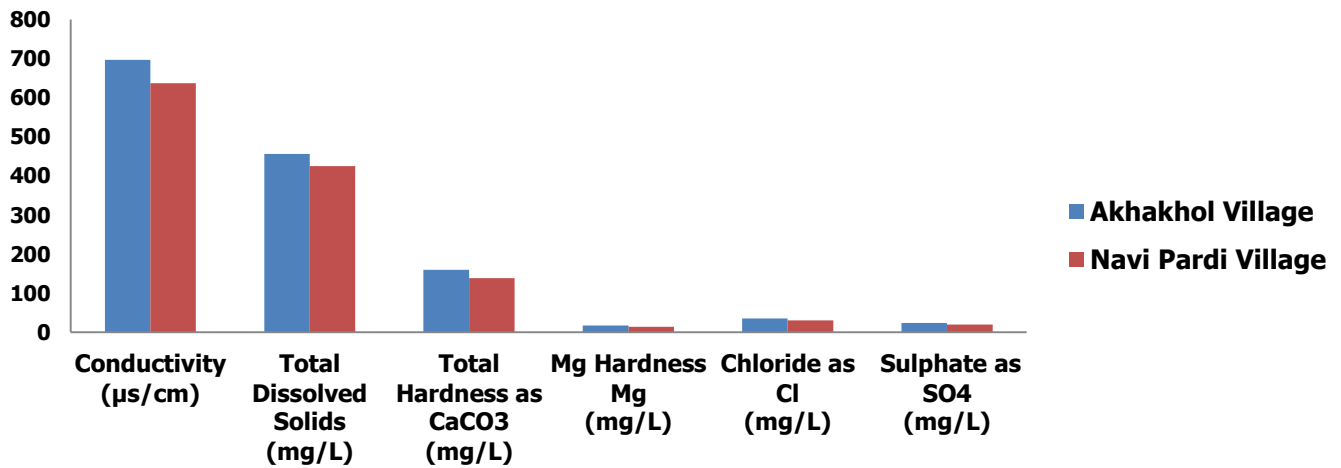
Detection Limit(in mg/L): Nitrate:0.5, Iron:0.1,Mercury as Hg:0.005, Cadmium as Cd :0.002, Selenium as Se:0.002, Arsenic as As:0.005, Cyanide as CN:0.001, Lead as Pb:0.005, Zinc:0.06, Hexavalent Chromium as Cr<sup>+6</sup>:0.05 - Not mentioned in graph.



**TABLE 3.4 RESULT OF GROUND WATER [JULY 2023]**

| Date of Sampling |   |       | 20/07/2023       | 20/07/2023         |
|------------------|---|-------|------------------|--------------------|
| SR. NO.          | PARAMETERS                              | UNIT  | AKHAKHOL VILLAGE | NAVI PARDI VILLAGE |
| 1                | pH                                      | --    | 7.36             | 7.73               |
| 2                | Temperature                             | °C    | 31.2             | 31.2               |
| 3                | Turbidity                               | NTU   | 0.35             | 0.34               |
| 4                | Conductivity                            | µs/cm | 697              | 637                |
| 5                | Total Dissolved Solids                  | mg/L  | 456              | 425                |
| 6                | Total Suspended Solids                  | mg/L  | 10               | 9                  |
| 7                | Alkalinity                              | mg/L  | 147              | 149                |
| 8                | Total Hardness                          | mg/L  | 160              | 138                |
| 9                | Ca Hardness as Ca                       | mg/L  | 35.6             | 32.4               |
| 10               | Mg Hardness as Mg                       | mg/L  | 17.04            | 13.68              |
| 11               | Chloride as Cl                          | mg/L  | 34.99            | 30.49              |
| 12               | Nitrate as NO <sub>3</sub>              | mg/L  | Not Detected     | Not Detected       |
| 13               | Sulphate as SO <sub>4</sub>             | mg/L  | 23.65            | 19.87              |
| 14               | Iron as Fe                              | mg/L  | Not Detected     | Not Detected       |
| 15               | Mercury as Hg                           | mg/L  | Not Detected     | Not Detected       |
| 16               | Cadmium as Cd                           | mg/L  | Not Detected     | Not Detected       |
| 17               | Selenium as Se                          | mg/L  | Not Detected     | Not Detected       |
| 18               | Arsenic as As                           | mg/L  | Not Detected     | Not Detected       |
| 19               | Cyanide as CN                           | mg/L  | Not Detected     | Not Detected       |
| 20               | Lead as Pb                              | mg/L  | Not Detected     | Not Detected       |
| 21               | Zinc as Zn                              | mg/L  | Not Detected     | Not Detected       |
| 22               | Hexavalent Chromium as Cr <sup>+6</sup> | mg/L  | Not Detected     | Not Detected       |
| 23               | Water Table (Depth)                     | meter | 6.40             | 6.10               |

**ANALYSIS RESULTS OF GROUND WATER [JULY 2023]**



NS\*: Not Specified

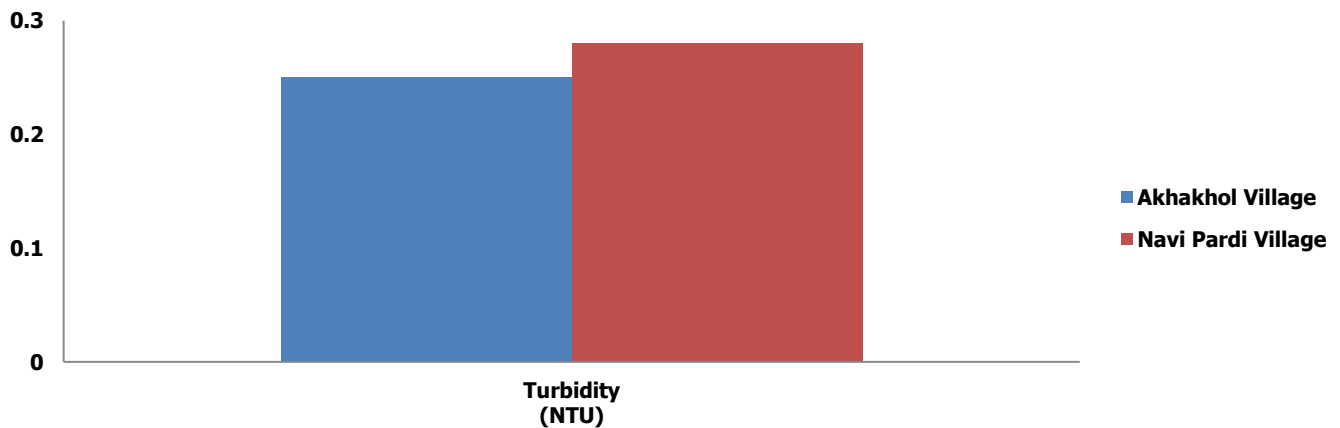
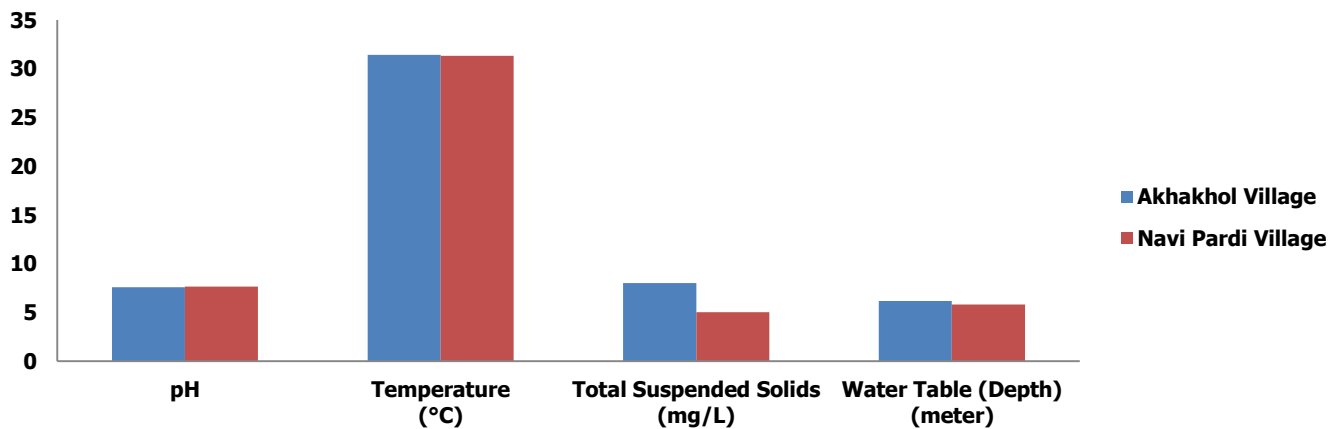
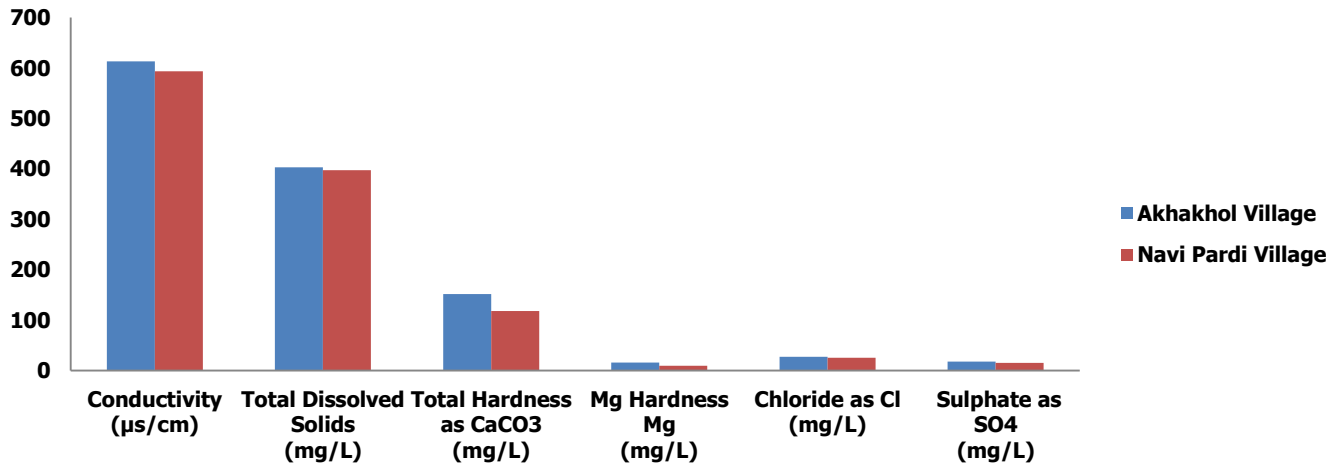
Detection Limit(in mg/L): Nitrate:0.5, Iron:0.1,Mercury as Hg:0.005, Cadmium as Cd :0.002, Selenium as Se:0.002, Arsenic as As:0.005, Cyanide as CN:0.001, Lead as Pb:0.005, Zinc:0.06, Hexavalent Chromium as Cr<sup>+6</sup>:0.05 - Not mentioned in graph.



**TABLE 3.5 RESULT OF GROUND WATER [AUGUST 2023]**

| Date of Sampling |   |       | 09/08/2023       | 09/08/2023        |
|------------------|---|-------|------------------|-------------------|
| SR. NO.          | PARAMETERS                              | UNIT  | AKHAKHOL VILLAGE | NAVI PARDIVILLAGE |
| 1                | pH                                      | --    | 7.58             | 7.65              |
| 2                | Temperature                             | °C    | 31.4             | 31.3              |
| 3                | Turbidity                               | NTU   | 0.25             | 0.28              |
| 4                | Conductivity                            | µs/cm | 613              | 593               |
| 5                | Total Dissolved Solids                  | mg/L  | 403              | 397               |
| 6                | Total Suspended Solids                  | mg/L  | 8                | 5                 |
| 7                | Alkalinity                              | mg/L  | 132              | 124               |
| 8                | Total Hardness                          | mg/L  | 152              | 118               |
| 9                | Ca Hardness as Ca                       | mg/L  | 33.6             | 30.4              |
| 10               | Mg Hardness as Mg                       | mg/L  | 16.32            | 10.08             |
| 11               | Chloride as Cl                          | mg/L  | 27.49            | 25.49             |
| 12               | Nitrate as NO <sub>3</sub>              | mg/L  | Not Detected     | Not Detected      |
| 13               | Sulphate as SO <sub>4</sub>             | mg/L  | 18.26            | 15.20             |
| 14               | Iron as Fe                              | mg/L  | Not Detected     | Not Detected      |
| 15               | Mercury as Hg                           | mg/L  | Not Detected     | Not Detected      |
| 16               | Cadmium as Cd                           | mg/L  | Not Detected     | Not Detected      |
| 17               | Selenium as Se                          | mg/L  | Not Detected     | Not Detected      |
| 18               | Arsenic as As                           | mg/L  | Not Detected     | Not Detected      |
| 19               | Cyanide as CN                           | mg/L  | Not Detected     | Not Detected      |
| 20               | Lead as Pb                              | mg/L  | Not Detected     | Not Detected      |
| 21               | Zinc as Zn                              | mg/L  | Not Detected     | Not Detected      |
| 22               | Hexavalent Chromium as Cr <sup>+6</sup> | mg/L  | Not Detected     | Not Detected      |
| 23               | Water Table (Depth)                     | meter | 6.15             | 5.80              |

**ANALYSIS RESULTS OF GROUND WATER [AUGUST 2023]**



NS\*: Not Specified

Detection Limit(in mg/L): Nitrate:0.5, Iron:0.1,Mercury as Hg:0.005, Cadmium as Cd :0.002, Selenium as Se:0.002, Arsenic as As:0.005, Cyanide as CN:0.001, Lead as Pb:0.005, Zinc:0.06, Hexavalent Chromium as Cr<sup>+6</sup>:0.05 - Not mentioned in graph.

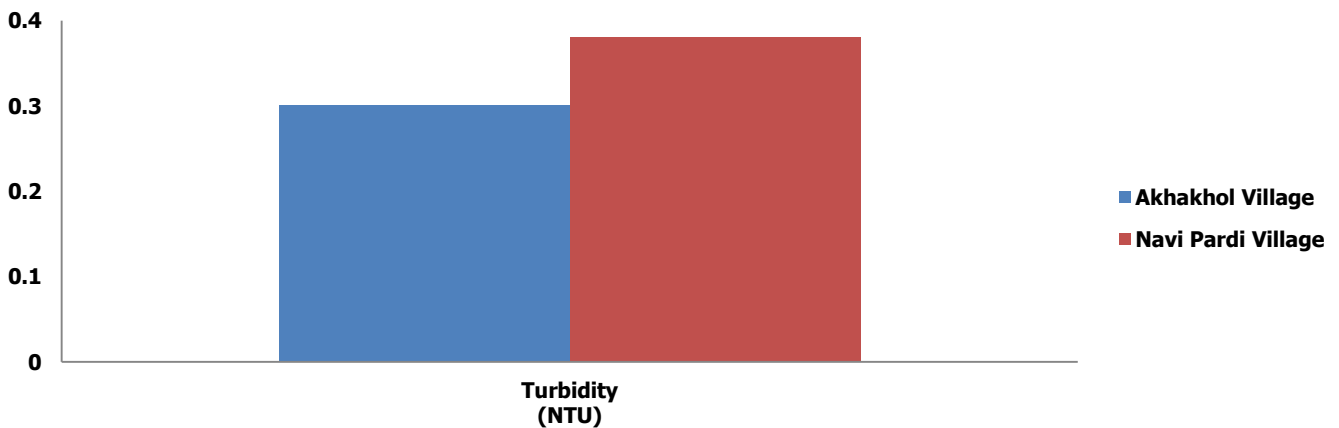
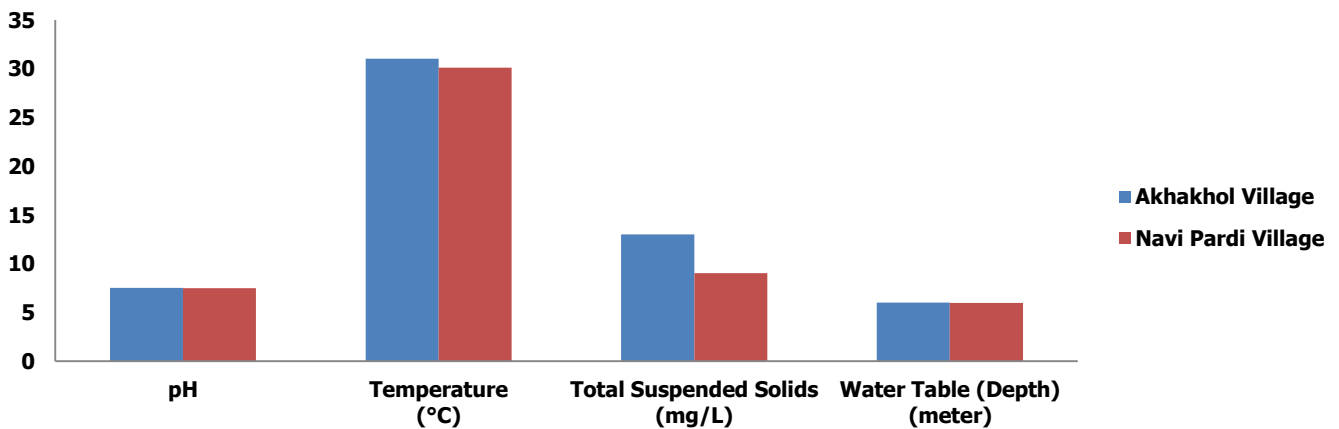
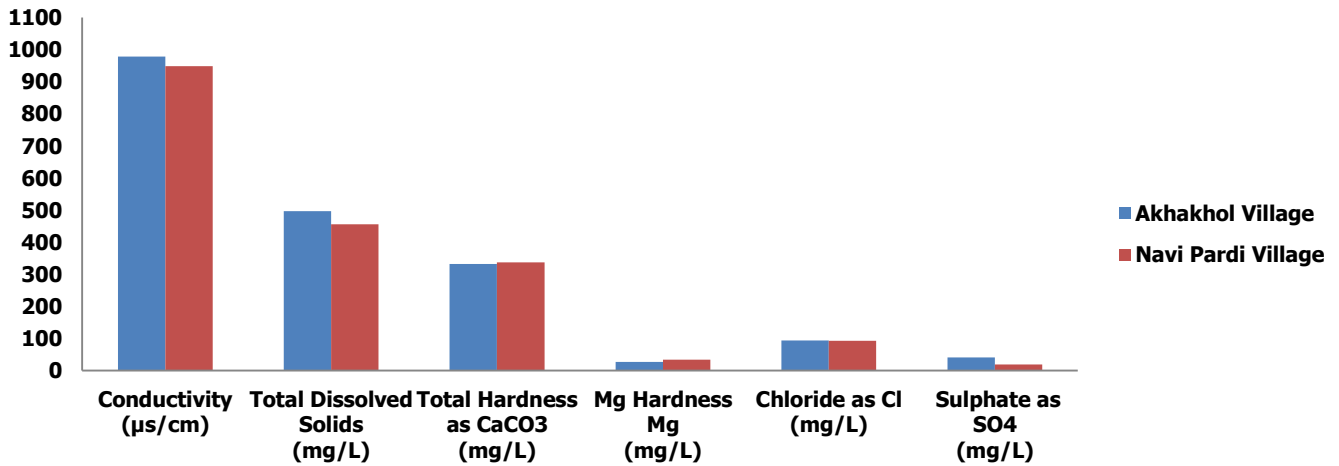


**TABLE 3.6 RESULT OF GROUND WATER [SEPTEMBER 2023]**

| Date of Sampling |   |       | 16/09/2023       | 16/09/2023         |
|------------------|---|-------|------------------|--------------------|
| SR. NO.          | PARAMETERS                              | UNIT  | AKHAKHOL VILLAGE | NAVI PARDI VILLAGE |
| 1                | pH                                      | --    | 7.51             | 7.46               |
| 2                | Temperature                             | °C    | 31.0             | 30.1               |
| 3                | Turbidity                               | NTU   | 0.30             | 0.38               |
| 4                | Conductivity                            | µs/cm | 978              | 948                |
| 5                | Total Dissolved Solids                  | mg/L  | 497              | 456                |
| 6                | Total Suspended Solids                  | mg/L  | 13               | 9                  |
| 7                | Alkalinity                              | mg/L  | 290              | 291                |
| 8                | Total Hardness                          | mg/L  | 332              | 337                |
| 9                | Ca Hardness as Ca                       | mg/L  | 88.0             | 78.4               |
| 10               | Mg Hardness as Mg                       | mg/L  | 26.88            | 33.84              |
| 11               | Chloride as Cl                          | mg/L  | 93.97            | 93.47              |
| 12               | Nitrate as NO <sub>3</sub>              | mg/L  | Not Detected     | Not Detected       |
| 13               | Sulphate as SO <sub>4</sub>             | mg/L  | 41.26            | 19.80              |
| 14               | Iron as Fe                              | mg/L  | Not Detected     | Not Detected       |
| 15               | Mercury as Hg                           | mg/L  | Not Detected     | Not Detected       |
| 16               | Cadmium as Cd                           | mg/L  | Not Detected     | Not Detected       |
| 17               | Selenium as Se                          | mg/L  | Not Detected     | Not Detected       |
| 18               | Arsenic as As                           | mg/L  | Not Detected     | Not Detected       |
| 19               | Cyanide as CN                           | mg/L  | Not Detected     | Not Detected       |
| 20               | Lead as Pb                              | mg/L  | Not Detected     | Not Detected       |
| 21               | Zinc as Zn                              | mg/L  | Not Detected     | Not Detected       |
| 22               | Hexavalent Chromium as Cr <sup>+6</sup> | mg/L  | Not Detected     | Not Detected       |
| 23               | Water Table (Depth)                     | meter | 6.00             | 5.95               |



**ANALYSIS RESULTS OF GROUND WATER [SEPTEMBER 2023]**



NS\*: Not Specified

Detection Limit(in mg/L): Nitrate:0.5, Iron:0.1,Mercury as Hg:0.005, Cadmium as Cd :0.002, Selenium as Se:0.002, Arsenic as As:0.005, Cyanide as CN:0.001, Lead as Pb:0.005, Zinc:0.06, Hexavalent Chromium as Cr<sup>+6</sup>:0.05 - Not mentioned in graph.



## **CHAPTER 4**

### **4.0 RESULTS OF TREATED EFFLUENT WATER QUALITY**

#### **MONITORING**

**MONITORING PERIOD: APRIL 2023 TO SEPTEMBER 2023**

#### **4.0 TREATED EFFLUENT WATER QUALITY MONITORING:**

##### **MONITORING DETAILS [APRIL 2023 TO SEPTEMBER 2023]**

| <b>SR. NO.</b> | <b>MONITORING STATIONS</b>                          | <b>LANDMARKS</b> |
|----------------|---|------------------|
| 1              | <b>TEW</b> – GPS Location:N21°20.399' E 072°59.021' | Guard Pond       |

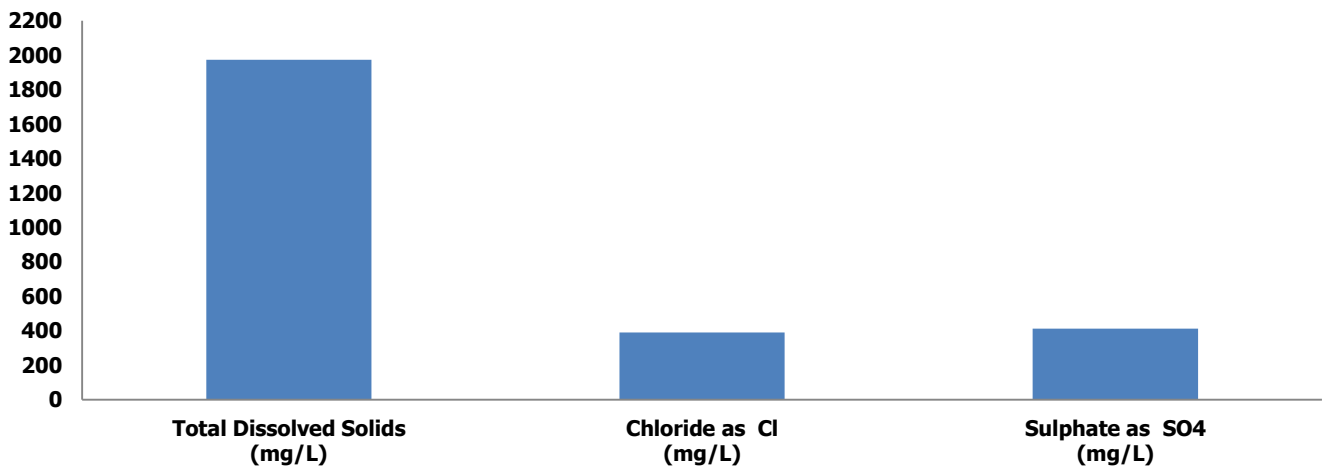
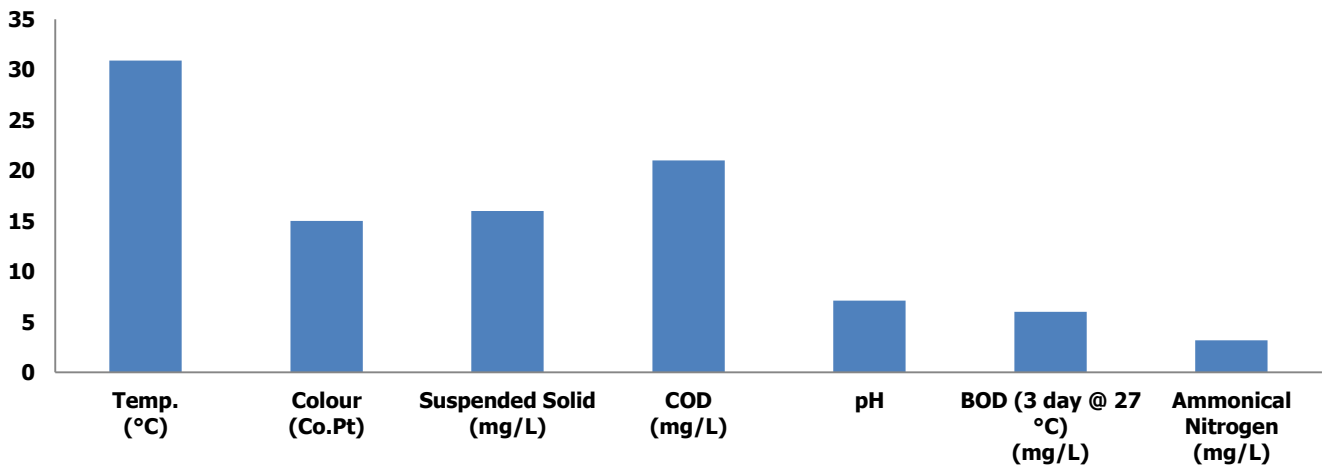
##### **ANALYSIS METHOD DETAILS:**

| <b>SR. NO.</b> | <b>PARAMETERS</b>      | <b>UNIT</b> | <b>GPCB NORMS</b> | <b>METHOD ADOPTED</b>  | <b>MINIMUM DETECTABLE LIMIT</b> |
|----------------|------------------------|-------------|-------------------|--|---------------------------------|
| 1              | pH                     | --          | 6.5 to 8.5        | IS 3025 (Part-11)<br>Electrometric Method                        | 2                               |
| 2              | Temperature            | °C          | 40°C              | IS 3025 (Part-9)   | 2                               |
| 3              | Colour                 | Co. Pt      | 100 Co-pt scale   | IS 3025 (Part-4)   | 1                               |
| 4              | Oil and Grease         | mg/L        | 10 mg/L           | APHA (23rd Edition) 5520 B                                       | 2                               |
| 5              | Suspended Solid        | mg/L        | 300 mg/L          | IS 3025 (Part – 17)  | 2                               |
| 6              | Phenolic Compound      | mg/L        | 1 mg/L            | IS 3025 (Part-43)<br>Aminoantipyrine Method                      | 0.01                            |
| 7              | Sulphide               | mg/L        | 2 mg/L            | APHA (23rd Edition) 4500 S2 F<br>Iodometric Method               | 0.1                             |
| 8              | Total Dissolved Solids | mg/L        | 2100 mg/L         | IS 3025 (Part-16)  | 5                               |
| 9              | BOD (3 day @ 27 °C)    | mg/L        | 30 mg/L           | IS 3025 (Part-44)  | 1                               |
| 10             | COD                    | mg/L        | 100 mg/L          | APHA (23 <sup>rd</sup> Edition) 5220 B<br>Open Reflux Method     | 5                               |
| 11             | Hexavalent Chromium    | mg/L        | 0.1 mg/L          | APHA (23 <sup>rd</sup> Edition) 3500 Cr B<br>Colorimetric Method | 0.05                            |
| 12             | Total Chromium         | mg/L        | 2 mg/L            | APHA (23 <sup>rd</sup> Edition) 3111 B                           | 0.05                            |
| 13             | Ammonical Nitrogen     | mg/L        | 50 mg/L           | IS 3025 (Part-34)<br>Nesslerization Method                       | 0.2                             |
| 14             | Chloride               | mg/L        | 600 mg/L          | IS 3025 (Part-32)<br>Argentometric Method                        | 1                               |
| 15             | Sulphate               | mg/L        | 1000 mg/L         | IS 3025 (Part-24)<br>Turbidimetric Method                        | 1                               |

**TABLE 4.1 RESULT OF TREATED EFFLUENT WATER [APRIL 2023]**

| SR. NO. | PARAMETERS             | UNIT   | GUARD POND DISCHARGE |                 |
|---------|------------------------|--------|----------------------|-----------------|
|         |                        |        | 20/04/2023           | GPCB NORMS      |
| 1       | pH                     | --     | 7.12                 | 6.5 to 8.5      |
| 2       | Temperature            | °C     | 30.9                 | 40°C            |
| 3       | Colour                 | Co. Pt | 15                   | 100 Co-pt scale |
| 4       | Oil and Grease         | mg/L   | Not Detected         | 10 mg/L         |
| 5       | Suspended Solid        | mg/L   | 16                   | 300 mg/L        |
| 6       | Phenolic Compound      | mg/L   | Not Detected         | 1 mg/L          |
| 7       | Sulphide               | mg/L   | Not Detected         | 2 mg/L          |
| 8       | Total Dissolved Solids | mg/L   | 1972                 | 2100 mg/L       |
| 9       | BOD (3 day @ 27 °C)    | mg/L   | 6.0                  | 30 mg/L         |
| 10      | COD                    | mg/L   | 21.0                 | 100 mg/L        |
| 11      | Hexavalent Chromium    | mg/L   | Not Detected         | 0.1 mg/L        |
| 12      | Total Chromium         | mg/L   | Not Detected         | 2 mg/L          |
| 13      | Ammonical Nitrogen     | mg/L   | 3.18                 | 50 mg/L         |
| 14      | Chloride               | mg/L   | 390                  | 600 mg/L        |
| 15      | Sulphate               | mg/L   | 412                  | 1000 mg/L       |

**ANALYSIS RESULT OF TREATED EFFLUENT WATER [APRIL 2023]**



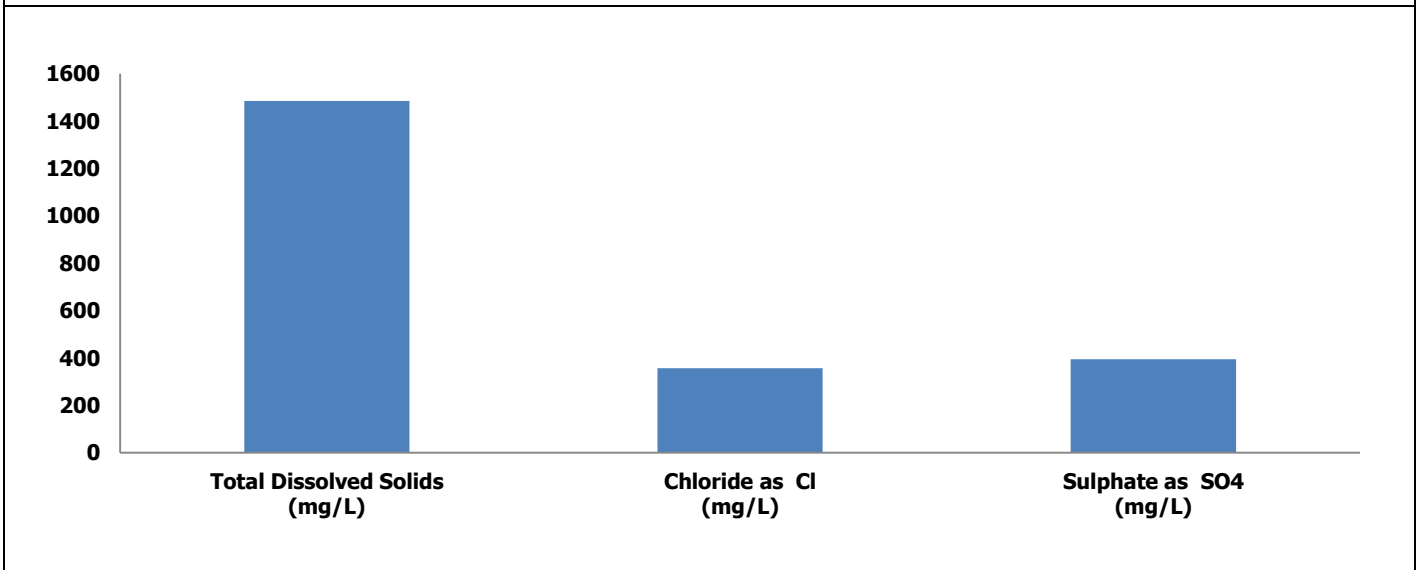
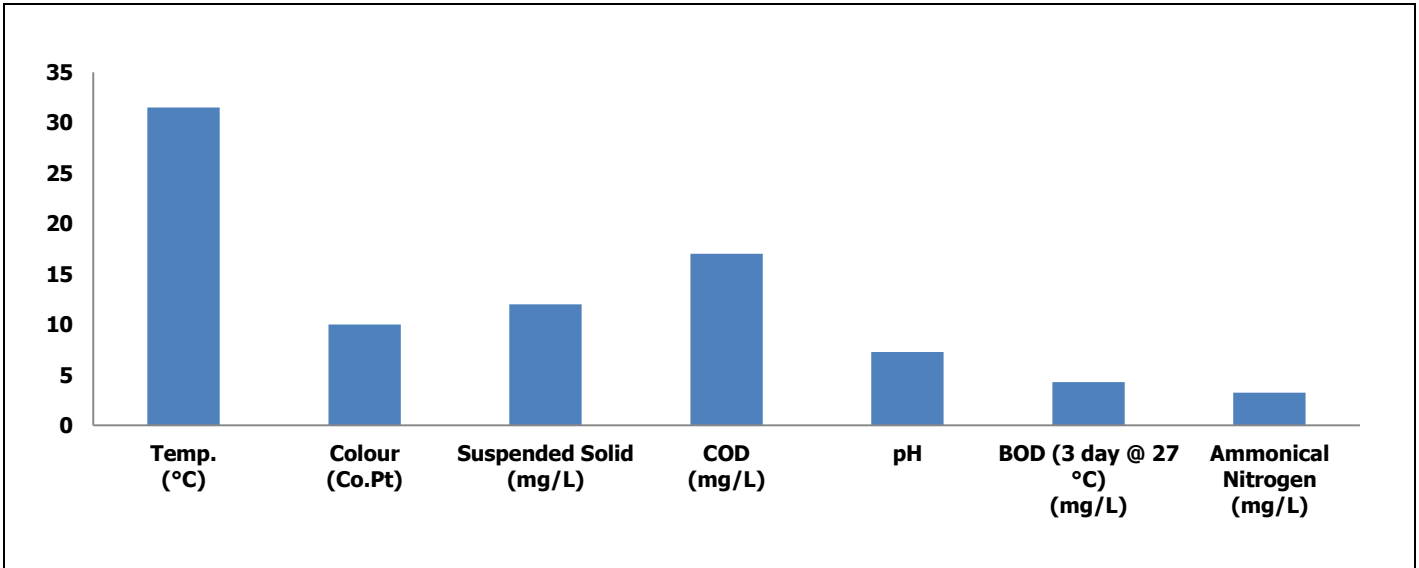
DetectionLimit(in mg/L): Oil and Grease: 2, Phenolic Compound: 0.01, Sulphide: 0.1, Hexavalent Chromium: 0.05, Total Chromium: 0.05, -Not mentioned in graph.

*[Handwritten Signature]*  


**TABLE 4.2 RESULT OF TREATED EFFLUENT WATER [MAY 2023]**

| SR. NO. | PARAMETERS             | UNIT   | GUARD POND DISCHARGE |                 |
|---------|------------------------|--------|----------------------|-----------------|
|         |                        |        | 15/05/2023           | GPCB NORMS      |
| 1       | pH                     | --     | 7.29                 | 6.5 to 8.5      |
| 2       | Temperature            | °C     | 31.5                 | 40°C            |
| 3       | Colour                 | Co. Pt | 10                   | 100 Co-pt scale |
| 4       | Oil and Grease         | mg/L   | Not Detected         | 10 mg/L         |
| 5       | Suspended Solid        | mg/L   | 12                   | 300 mg/L        |
| 6       | Phenolic Compound      | mg/L   | Not Detected         | 1 mg/L          |
| 7       | Sulphide               | mg/L   | Not Detected         | 2 mg/L          |
| 8       | Total Dissolved Solids | mg/L   | 1485                 | 2100 mg/L       |
| 9       | BOD (3 day @ 27 °C)    | mg/L   | 4.3                  | 30 mg/L         |
| 10      | COD                    | mg/L   | 17.0                 | 100 mg/L        |
| 11      | Hexavalent Chromium    | mg/L   | Not Detected         | 0.1 mg/L        |
| 12      | Total Chromium         | mg/L   | Not Detected         | 2 mg/L          |
| 13      | Ammonical Nitrogen     | mg/L   | 3.26                 | 50 mg/L         |
| 14      | Chloride               | mg/L   | 357                  | 600 mg/L        |
| 15      | Sulphate               | mg/L   | 394                  | 1000 mg/L       |

**ANALYSIS RESULT OF TREATED EFFLUENT WATER [MAY 2023]**



Detection Limit (in mg/L): Oil and Grease: 2, Phenolic Compound: 0.01, Sulphide: 0.1, Hexavalent Chromium: 0.05, Total Chromium: 0.05, -Not mentioned in graph.

*[Handwritten Signature]*  
**POLLCON LABORATORIES PVT.LTD.**  
**SURAT-7.**

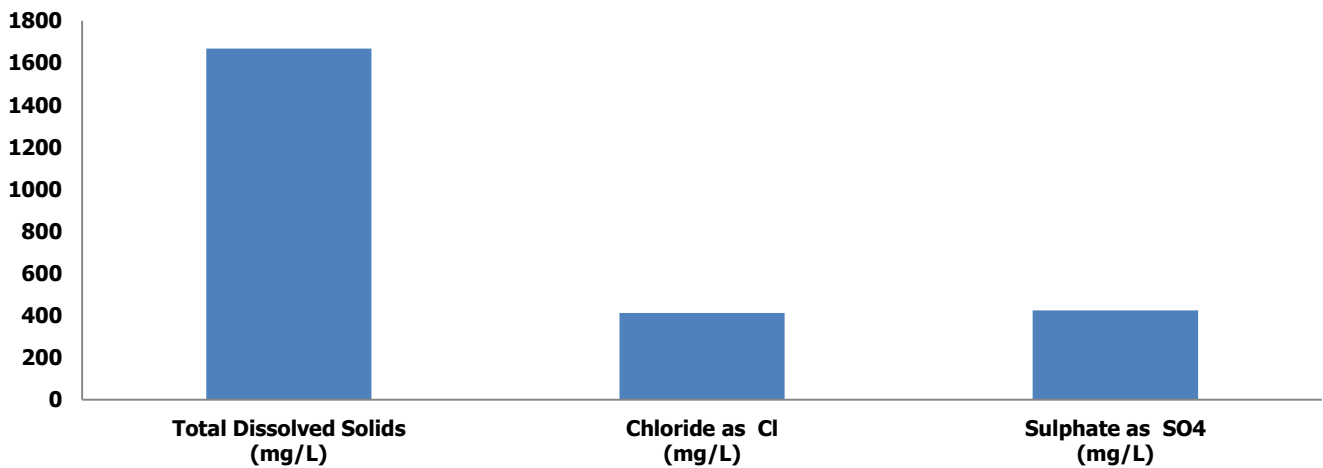
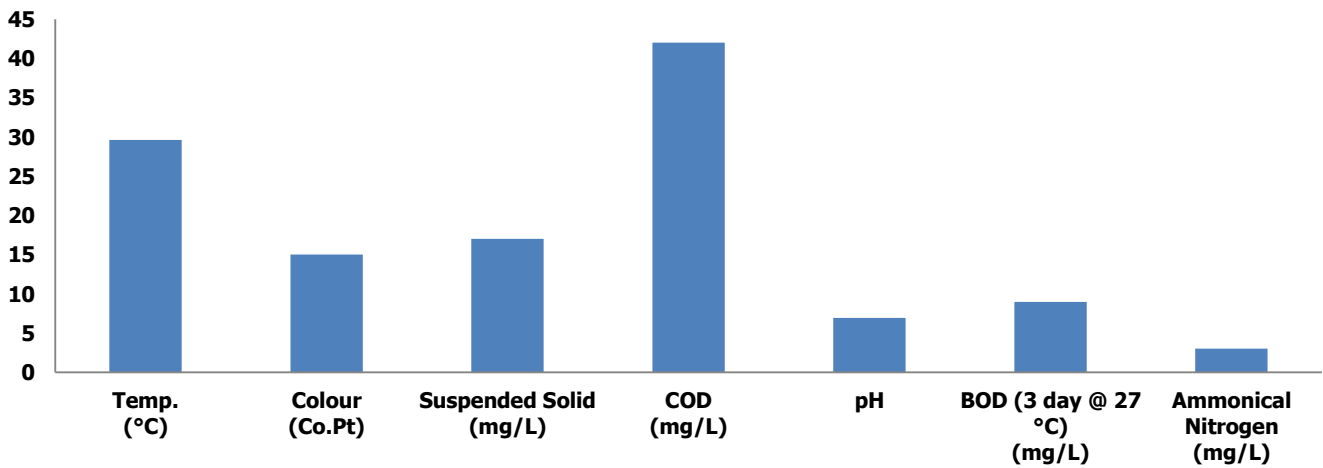
**TABLE 4.3 RESULT OF TREATED EFFLUENT WATER [JUNE 2023]**

| SR. NO. | PARAMETERS             | UNIT   | GUARD POND DISCHARGE |                 |
|---------|------------------------|--------|----------------------|-----------------|
|         |                        |        | 22/06/2023           | GPCB NORMS      |
| 1       | pH                     | --     | 6.96                 | 6.5 to 8.5      |
| 2       | Temperature            | °C     | 29.6                 | 40°C            |
| 3       | Colour                 | Co. Pt | 15                   | 100 Co-pt scale |
| 4       | Oil and Grease         | mg/L   | Not Detected         | 10 mg/L         |
| 5       | Suspended Solid        | mg/L   | 17                   | 300 mg/L        |
| 6       | Phenolic Compound      | mg/L   | Not Detected         | 1 mg/L          |
| 7       | Sulphide               | mg/L   | Not Detected         | 2 mg/L          |
| 8       | Total Dissolved Solids | mg/L   | 1668                 | 2100 mg/L       |
| 9       | BOD (3 day @ 27 °C)    | mg/L   | 9.0                  | 30 mg/L         |
| 10      | COD                    | mg/L   | 42.0                 | 100 mg/L        |
| 11      | Hexavalent Chromium    | mg/L   | Not Detected         | 0.1 mg/L        |
| 12      | Total Chromium         | mg/L   | Not Detected         | 2 mg/L          |
| 13      | Ammonical Nitrogen     | mg/L   | 3.02                 | 50 mg/L         |
| 14      | Chloride               | mg/L   | 411                  | 600 mg/L        |
| 15      | Sulphate               | mg/L   | 424                  | 1000 mg/L       |





**ANALYSIS RESULT OF TREATED EFFLUENT WATER [JUNE 2023]**



Detection Limit (in mg/L): Oil and Grease: 2, Phenolic Compound: 0.01, Sulphide: 0.1, Hexavalent Chromium: 0.05, Total Chromium: 0.05, -Not mentioned in graph.

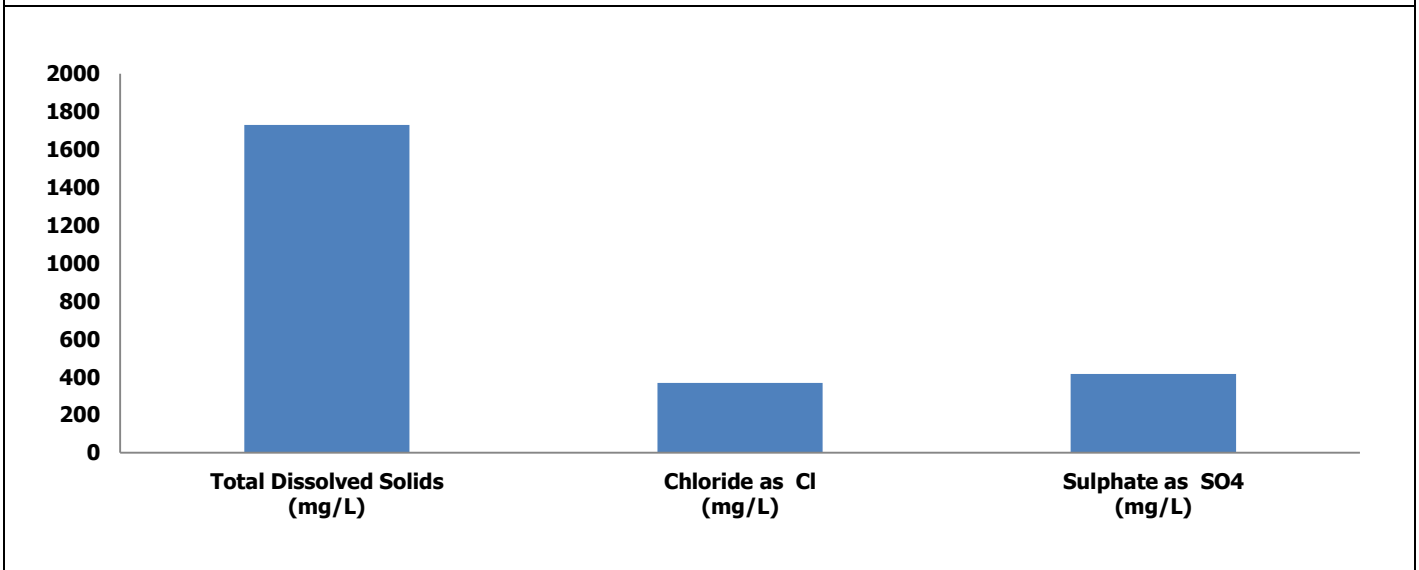
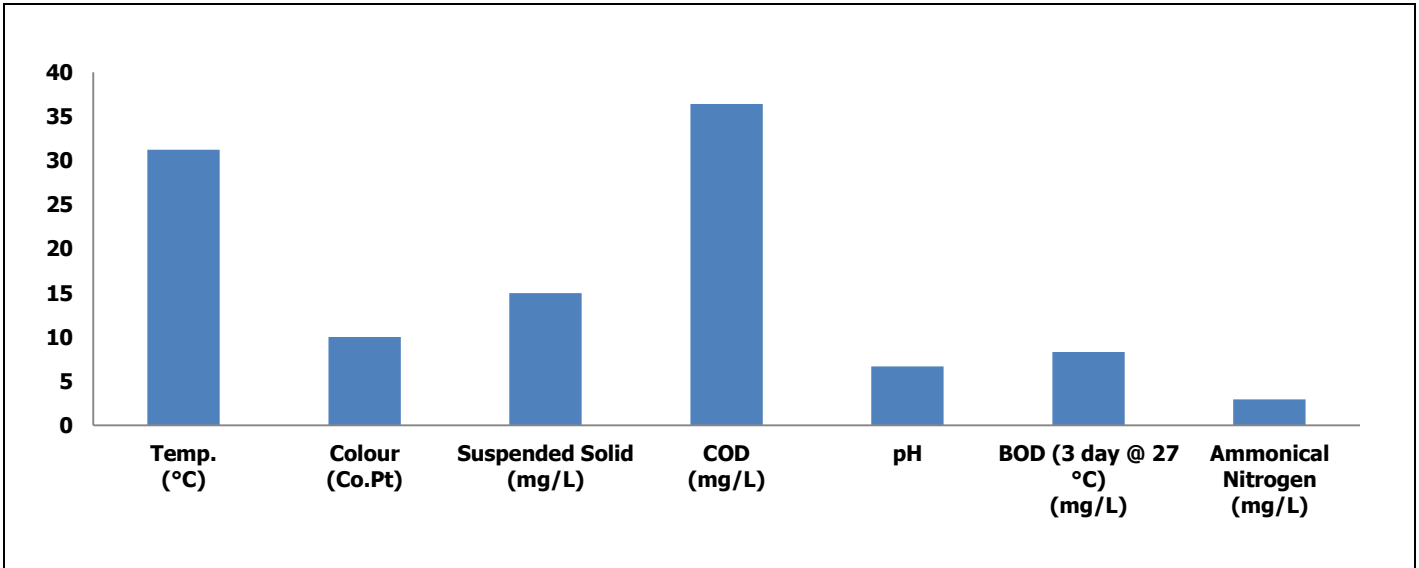
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**POLLCON LABORATORIES PVT.LTD.**  
**SURAT-7.**

**TABLE 4.4 RESULT OF TREATED EFFLUENT WATER [JULY 2023]**

| SR. NO. | PARAMETERS             | UNIT   | GUARD POND DISCHARGE |                 |
|---------|------------------------|--------|----------------------|-----------------|
|         |                        |        | 20/07/2023           | GPCB NORMS      |
| 1       | pH                     | --     | 6.69                 | 6.5 to 8.5      |
| 2       | Temperature            | °C     | 31.2                 | 40°C            |
| 3       | Colour                 | Co. Pt | 10                   | 100 Co-pt scale |
| 4       | Oil and Grease         | mg/L   | Not Detected         | 10 mg/L         |
| 5       | Suspended Solid        | mg/L   | 15                   | 300 mg/L        |
| 6       | Phenolic Compound      | mg/L   | Not Detected         | 1 mg/L          |
| 7       | Sulphide               | mg/L   | Not Detected         | 2 mg/L          |
| 8       | Total Dissolved Solids | mg/L   | 1729                 | 2100 mg/L       |
| 9       | BOD (3 day @ 27 °C)    | mg/L   | 8.3                  | 30 mg/L         |
| 10      | COD                    | mg/L   | 36.4                 | 100 mg/L        |
| 11      | Hexavalent Chromium    | mg/L   | Not Detected         | 0.1 mg/L        |
| 12      | Total Chromium         | mg/L   | Not Detected         | 2 mg/L          |
| 13      | Ammonical Nitrogen     | mg/L   | 2.96                 | 50 mg/L         |
| 14      | Chloride               | mg/L   | 368                  | 600 mg/L        |
| 15      | Sulphate               | mg/L   | 416                  | 1000 mg/L       |



**ANALYSIS RESULT OF TREATED EFFLUENT WATER [JULY 2023]**



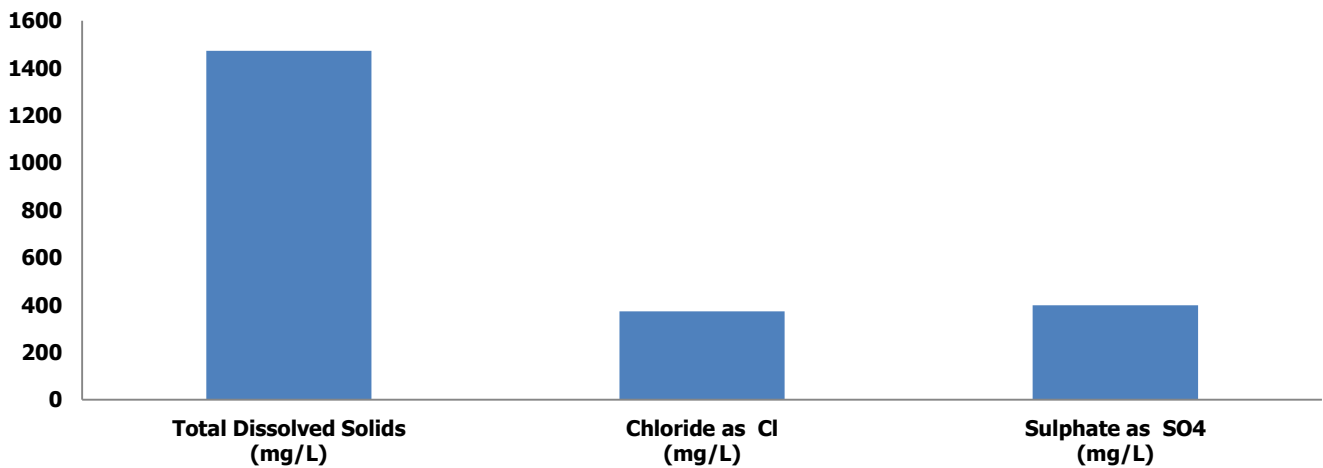
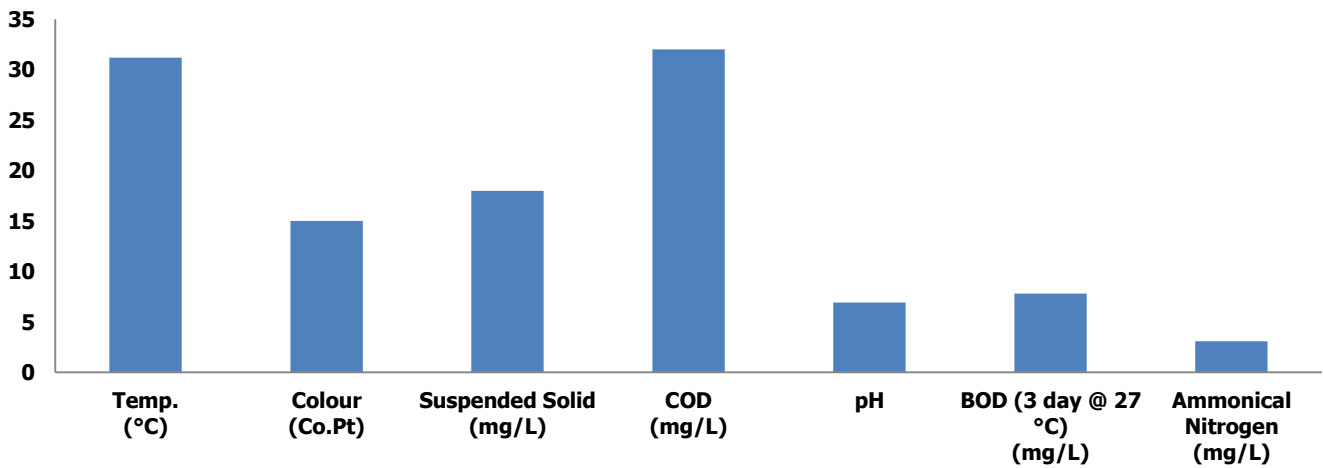
Detection Limit (in mg/L): Oil and Grease: 2, Phenolic Compound: 0.01, Sulphide: 0.1, Hexavalent Chromium: 0.05, Total Chromium: 0.05, -Not mentioned in graph.

*[Handwritten Signature]*  


**TABLE 4.5 RESULT OF TREATED EFFLUENT WATER [AUGUST 2023]**

| SR. NO. | PARAMETERS             | UNIT   | GUARD POND DISCHARGE |                 |
|---------|------------------------|--------|----------------------|-----------------|
|         |                        |        | 09/08/2023           | GPCB NORMS      |
| 1       | pH                     | --     | 6.94                 | 6.5 to 8.5      |
| 2       | Temperature            | °C     | 31.2                 | 40°C            |
| 3       | Colour                 | Co. Pt | 15                   | 100 Co-pt scale |
| 4       | Oil and Grease         | mg/L   | Not Detected         | 10 mg/L         |
| 5       | Suspended Solid        | mg/L   | 18                   | 300 mg/L        |
| 6       | Phenolic Compound      | mg/L   | Not Detected         | 1 mg/L          |
| 7       | Sulphide               | mg/L   | Not Detected         | 2 mg/L          |
| 8       | Total Dissolved Solids | mg/L   | 1472                 | 2100 mg/L       |
| 9       | BOD (3 day @ 27 °C)    | mg/L   | 7.8                  | 30 mg/L         |
| 10      | COD                    | mg/L   | 32.0                 | 100 mg/L        |
| 11      | Hexavalent Chromium    | mg/L   | Not Detected         | 0.1 mg/L        |
| 12      | Total Chromium         | mg/L   | Not Detected         | 2 mg/L          |
| 13      | Ammonical Nitrogen     | mg/L   | 3.10                 | 50 mg/L         |
| 14      | Chloride               | mg/L   | 373                  | 600 mg/L        |
| 15      | Sulphate               | mg/L   | 398                  | 1000 mg/L       |

**ANALYSIS RESULT OF TREATED EFFLUENT WATER [AUGUST 2023]**



Detection Limit (in mg/L): Oil and Grease: 2, Phenolic Compound: 0.01, Sulphide: 0.1, Hexavalent Chromium: 0.05, Total Chromium: 0.05, -Not mentioned in graph.

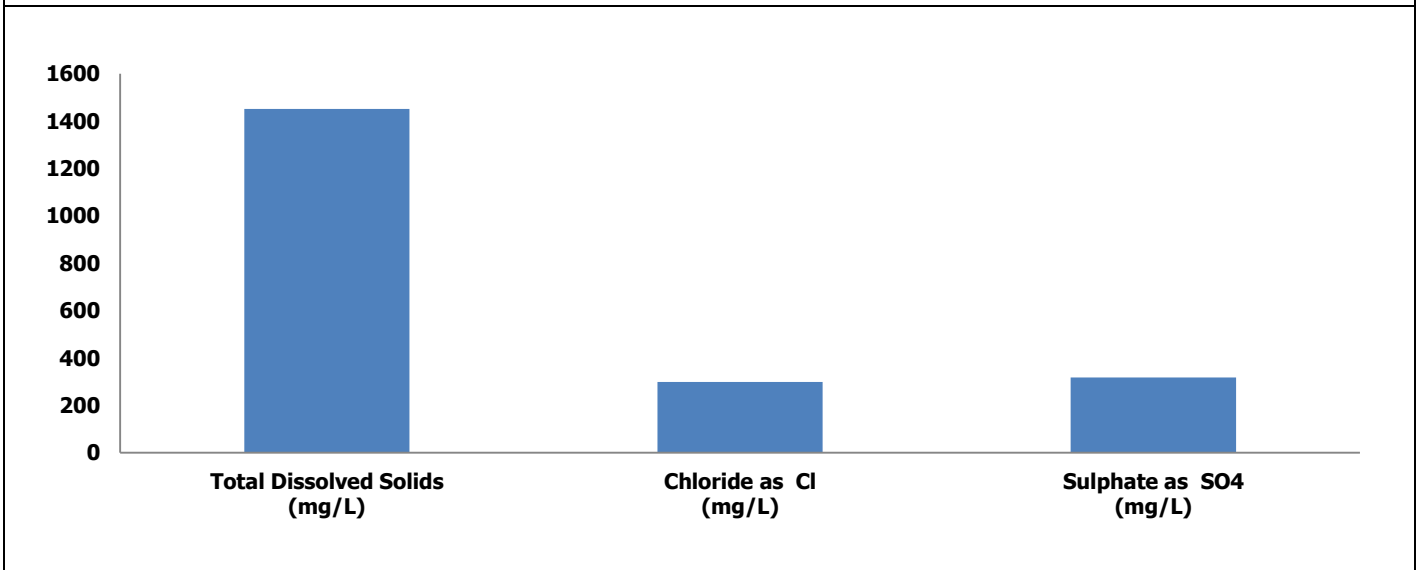
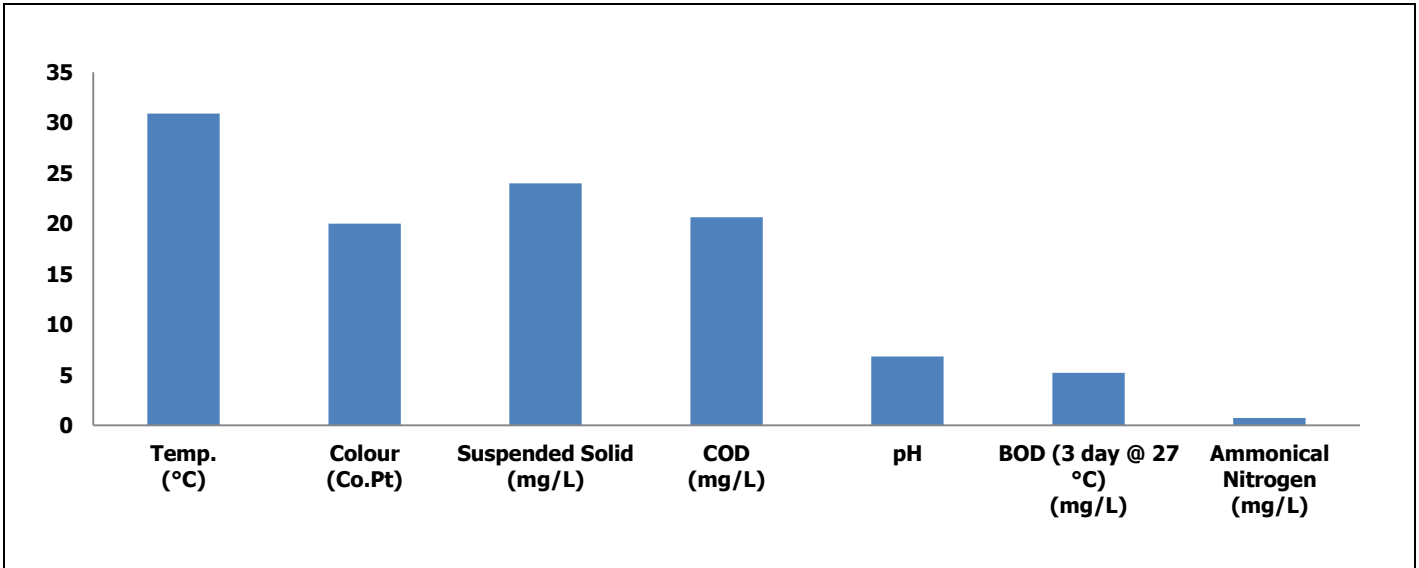
*[Handwritten Signature]*  
**POLLCON LABORATORIES PVT.LTD.**  
**SURAT-7.**

**TABLE 4.6 RESULT OF TREATED EFFLUENT WATER [SEPTEMBER 2023]**

| SR. NO. | PARAMETERS             | UNIT   | GUARD POND DISCHARGE |                 |
|---------|------------------------|--------|----------------------|-----------------|
|         |                        |        | 16/09/2023           | GPCB NORMS      |
| 1       | pH                     | --     | 6.82                 | 6.5 to 8.5      |
| 2       | Temperature            | °C     | 30.9                 | 40°C            |
| 3       | Colour                 | Co. Pt | 20                   | 100 Co-pt scale |
| 4       | Oil and Grease         | mg/L   | Not Detected         | 10 mg/L         |
| 5       | Suspended Solid        | mg/L   | 24                   | 300 mg/L        |
| 6       | Phenolic Compound      | mg/L   | Not Detected         | 1 mg/L          |
| 7       | Sulphide               | mg/L   | 0.8                  | 2 mg/L          |
| 8       | Total Dissolved Solids | mg/L   | 1451                 | 2100 mg/L       |
| 9       | BOD (3 day @ 27 °C)    | mg/L   | 5.2                  | 30 mg/L         |
| 10      | COD                    | mg/L   | 20.6                 | 100 mg/L        |
| 11      | Hexavalent Chromium    | mg/L   | Not Detected         | 0.1 mg/L        |
| 12      | Total Chromium         | mg/L   | Not Detected         | 2 mg/L          |
| 13      | Ammonical Nitrogen     | mg/L   | 0.74                 | 50 mg/L         |
| 14      | Chloride               | mg/L   | 299                  | 600 mg/L        |
| 15      | Sulphate               | mg/L   | 318                  | 1000 mg/L       |



**ANALYSIS RESULT OF TREATED EFFLUENT WATER [SEPTEMBER 2023]**



Detection Limit (in mg/L): Oil and Grease: 2, Phenolic Compound: 0.01, Sulphide: 0.1, Hexavalent Chromium: 0.05, Total Chromium: 0.05, -Not mentioned in graph.

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## **CHAPTER 5**

### **5.0 RESULTS OF TREATED SEWAGE WATER QUALITY MONITORING**

**MONITORING PERIOD: APRIL 2023 TO SEPTEMBER 2023**



## **5.0 SEWAGE WATER QUALITY MONITORING:**

### **MONITORING DETAILS [APRIL 2023 TO SEPTEMBER 2023]**

| <b>SR. NO.</b> | <b>MONITORING STATIONS</b>   | <b>LANDMARKS</b>       |
|----------------|--|------------------------|
| 1              | <b>(L1 – SW1)</b> (SUGEN PLANT)<br>GPS Location: N 21°20.393' E 072°59.087'          | SUGEN PLANT            |
| 2              | <b>(L2 – SW2)</b> Unit-40 (BEHIND ASWAD)<br>GPS Location: N 21°20.499' E 072°59.500' | Unit-40 (BEHIND ASWAD) |

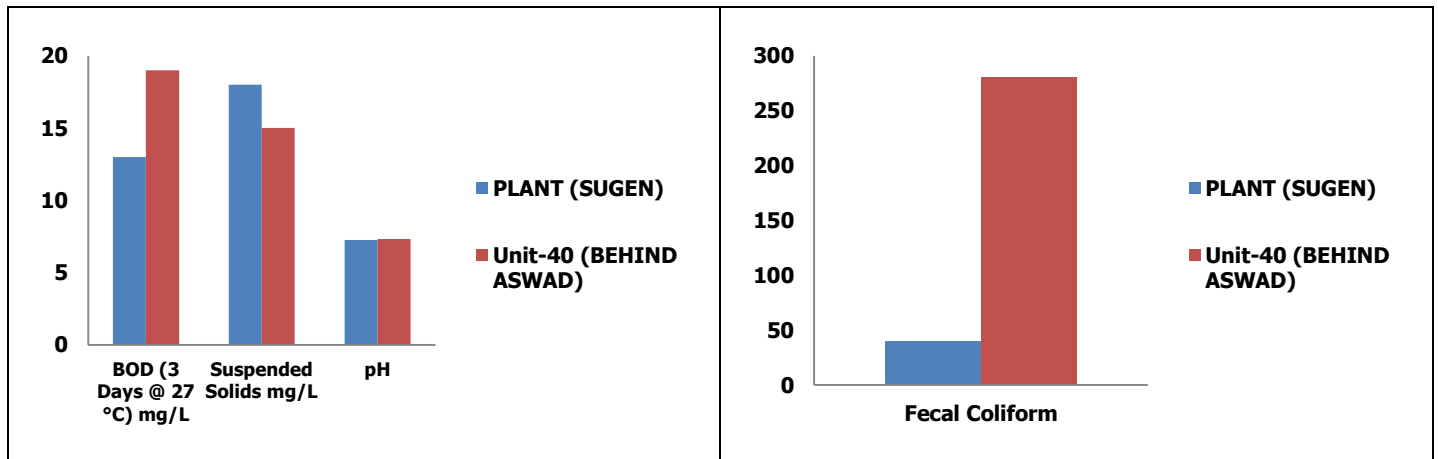
### **ANALYSIS METHOD DETAILS:**

| <b>SR. NO.</b> | <b>PARAMETERS</b>    | <b>UNIT</b> | <b>METHOD ADOPTED</b>                     | <b>GPCB NORMS</b> | <b>MINIMUM DETECTABLE LIMIT</b> |
|----------------|----------------------|-------------|---|-------------------|---------------------------------|
| 1              | BOD (3 Days @ 27 °C) | mg/L        | IS 3025 (Part-44)                         | <30 mg/L          | 1                               |
| 2              | Suspended Solids     | mg/L        | IS 3025 (Part – 17)                       | < 100 mg/L        | 2                               |
| 3              | pH                   | --          | IS 3025 (Part-11)<br>Electrometric Method | 6.5 to 9.0        | 2                               |
| 4              | Fecal Coliform       | MPN/100ml   | APHA(23rdEdi)9221 C&E                     | < 1000            | --                              |

**TABLE 5.1 RESULT OF SEWEGE WATER [APRIL 2023]**

| SR. NO. | PARAMETERS           | UNIT      | PLANT (SUGEN) | UNIT-40 (BEHIND ASWAD) | GPCB NORMS |
|---------|----------------------|-----------|---------------|------------------------|------------|
|         |                      |           | 20/04/2023    | 20/04/2023             |            |
| 1       | BOD (3 Days @ 27 °C) | mg/L      | 13            | 19                     | 30 mg/L    |
| 2       | Suspended Solids     | mg/L      | 18            | 15                     | < 100 mg/L |
| 3       | pH                   | --        | 7.25          | 7.32                   | 6.5 to 9.0 |
| 4       | Fecal Coliform       | MPN/100ml | 40            | 280                    | < 1000     |

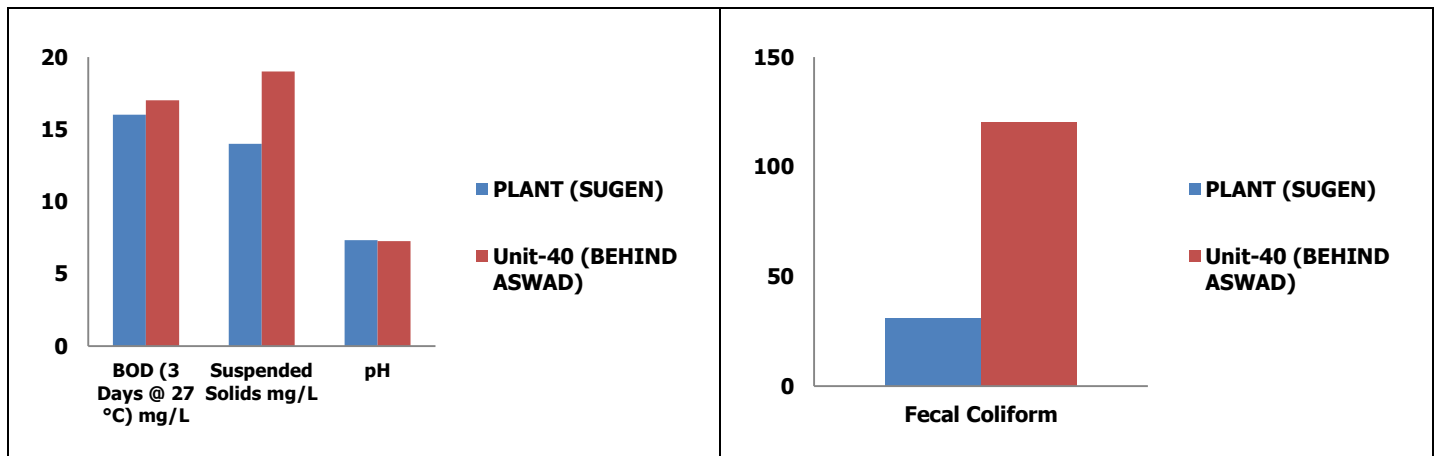
**ANALYSIS RESULT OF TREATED SEWAGE WATER [APRIL 2023]**



**TABLE 5.2 RESULT OF SEWEGE WATER [MAY 2023]**

| SR. NO. | PARAMETERS           | UNIT      | PLANT (SUGEN) | UNIT-40 (BEHIND ASWAD) | GPCB NORMS |
|---------|----------------------|-----------|---------------|------------------------|------------|
|         |                      |           | 15/05/2023    | 15/05/2023             |            |
| 1       | BOD (3 Days @ 27 °C) | mg/L      | 16            | 17                     | 30 mg/L    |
| 2       | Suspended Solids     | mg/L      | 14            | 19                     | < 100 mg/L |
| 3       | pH                   | --        | 7.32          | 7.25                   | 6.5 to 9.0 |
| 4       | Fecal Coliform       | MPN/100ml | 31            | 120                    | < 1000     |

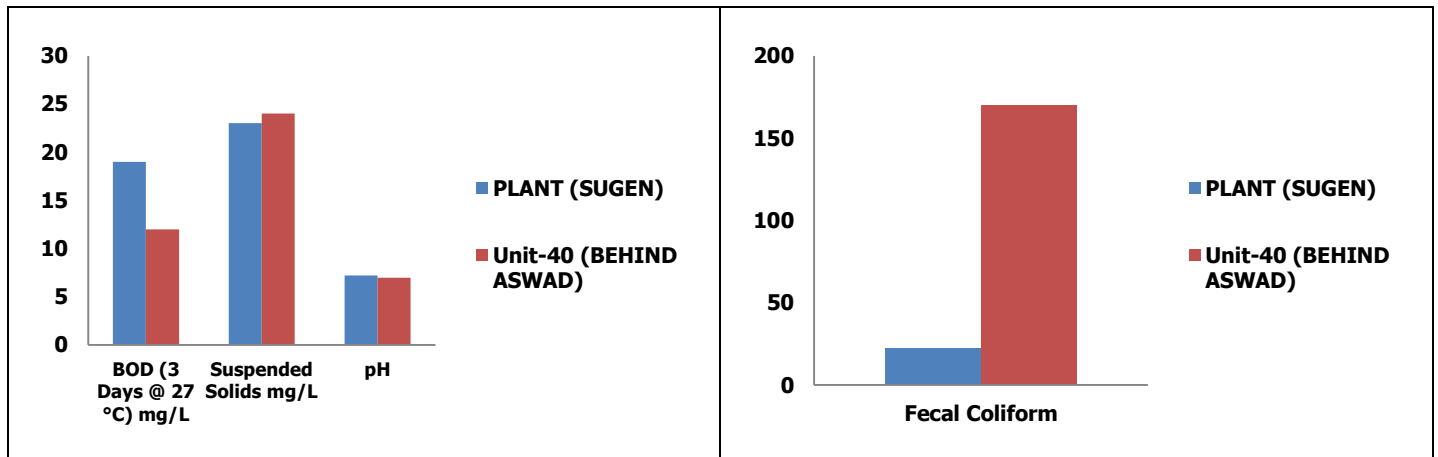
**ANALYSIS RESULT OF TREATED SEWAGE WATER [MAY 2023]**



**TABLE 5.3 RESULT OF SEWEGE WATER [JUNE 2023]**

| SR. NO. | PARAMETERS           | UNIT      | PLANT (SUGEN) | UNIT-40 (BEHIND ASWAD) | GPCB NORMS |
|---------|----------------------|-----------|---------------|------------------------|------------|
|         |                      |           | 22/06/2023    | 22/06/2023             |            |
| 1       | BOD (3 Days @ 27 °C) | mg/L      | 19            | 12                     | 30 mg/L    |
| 2       | Suspended Solids     | mg/L      | 23            | 24                     | < 100 mg/L |
| 3       | pH                   | --        | 7.21          | 6.98                   | 6.5 to 9.0 |
| 4       | Fecal Coliform       | MPN/100ml | 22            | 170                    | < 1000     |

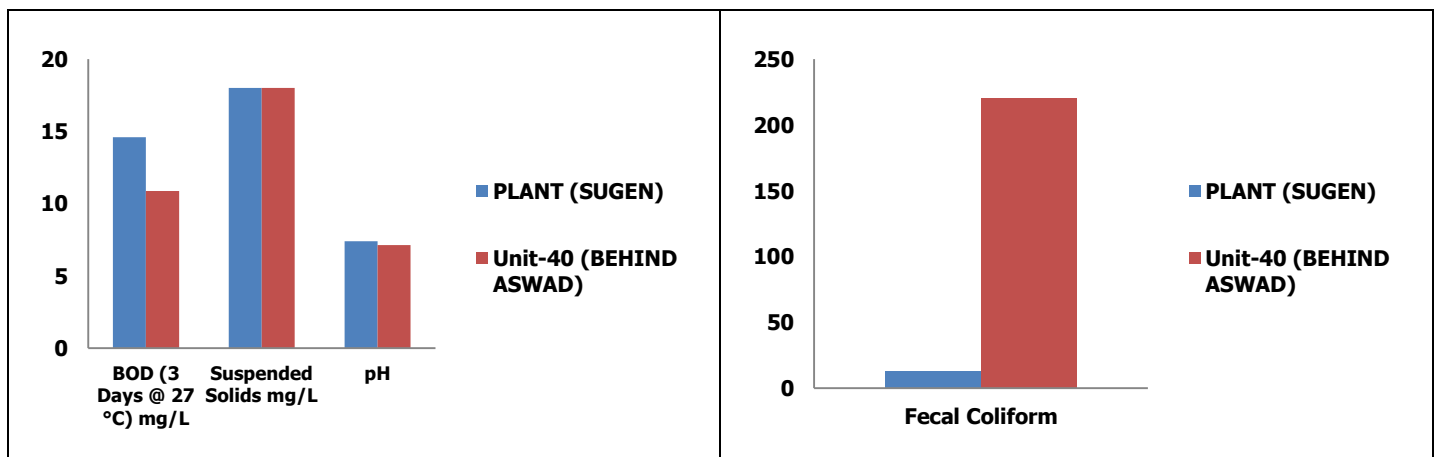
**ANALYSIS RESULT OF TREATED SEWAGE WATER [JUNE 2023]**



**TABLE 5.4 RESULT OF SEWEGE WATER [JULY 2023]**

| SR. NO. | PARAMETERS           | UNIT      | PLANT (SUGEN) | UNIT-40 (BEHIND ASWAD) | GPCB NORMS |
|---------|----------------------|-----------|---------------|------------------------|------------|
|         |                      |           | 20/07/2023    | 20/07/2023             |            |
| 1       | BOD (3 Days @ 27 °C) | mg/L      | 14.6          | 10.86                  | 30 mg/L    |
| 2       | Suspended Solids     | mg/L      | 18            | 18                     | < 100 mg/L |
| 3       | pH                   | --        | 7.39          | 7.13                   | 6.5 to 9.0 |
| 4       | Fecal Coliform       | MPN/100ml | 13            | 220                    | < 1000     |

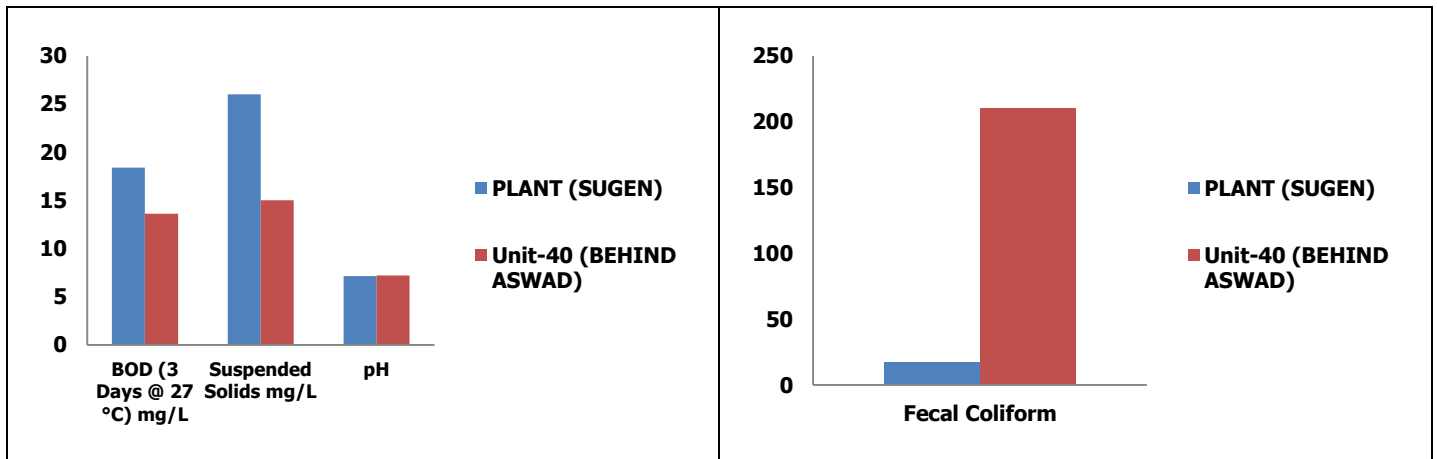
**ANALYSIS RESULT OF TREATED SEWAGE WATER [JULY 2023]**



**TABLE 5.5 RESULT OF SEWEGE WATER [AUGUST 2023]**

| SR. NO. | PARAMETERS           | UNIT      | PLANT (SUGEN) | UNIT-40 (BEHIND ASWAD) | GPCB NORMS |
|---------|----------------------|-----------|---------------|------------------------|------------|
|         |                      |           | 09/08/2023    | 09/08/2023             |            |
| 1       | BOD (3 Days @ 27 °C) | mg/L      | 18.4          | 13.6                   | 30 mg/L    |
| 2       | Suspended Solids     | mg/L      | 26            | 15                     | < 100 mg/L |
| 3       | pH                   | --        | 7.12          | 7.2                    | 6.5 to 9.0 |
| 4       | Fecal Coliform       | MPN/100ml | 17            | 210                    | < 1000     |

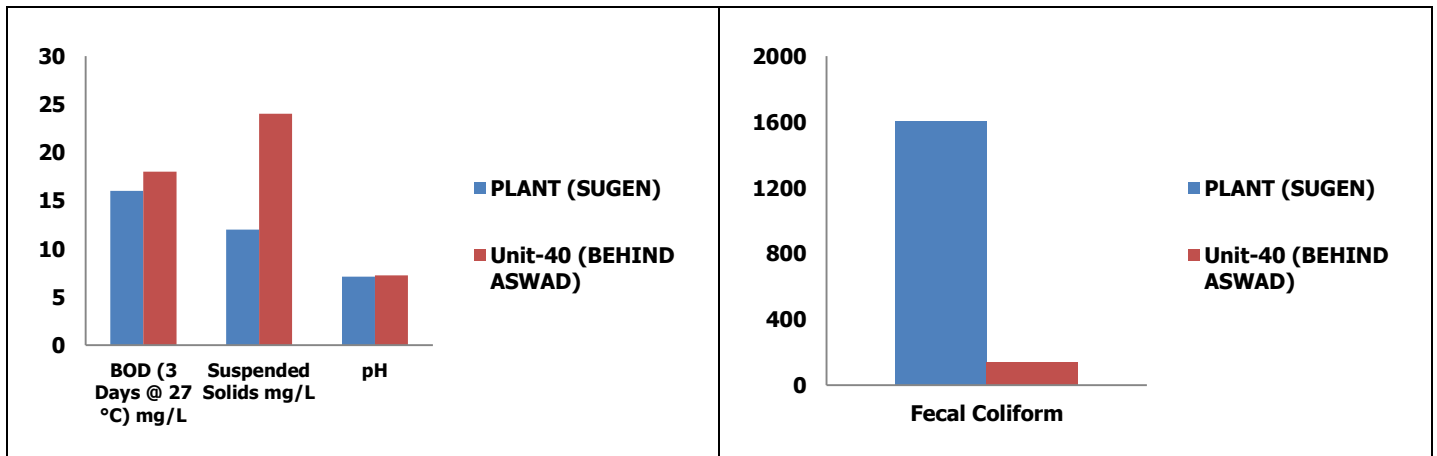
**ANALYSIS RESULT OF TREATED SEWAGE WATER [AUGUST 2023]**



**TABLE 5.6 RESULT OF SEWEGE WATER [SEPTEMBER 2023]**

| SR. NO. | PARAMETERS           | UNIT      | PLANT (SUGEN) | UNIT-40 (BEHIND ASWAD) | GPCB NORMS |
|---------|----------------------|-----------|---------------|------------------------|------------|
|         |                      |           | 16/09/2023    | 16/09/2023             |            |
| 1       | BOD (3 Days @ 27 °C) | mg/L      | 16            | 18                     | 30 mg/L    |
| 2       | Suspended Solids     | mg/L      | 12            | 24                     | < 100 mg/L |
| 3       | pH                   | --        | 7.10          | 7.23                   | 6.5 to 9.0 |
| 4       | Fecal Coliform       | MPN/100ml | >1600         | 140                    | < 1000     |

**ANALYSIS RESULT OF TREATED SEWAGE WATER [SEPTEMBER 2023]**



## **CHAPTER 6**

### **6.0 RESULTS OF SOIL QUALITY MONITORING**

**MONITORING PERIOD: APRIL 2023 TO SEPTEMBER 2023**

## **6.0 SOIL QUALITY MONITORING:**

### **MONITORING DETAILS:**

| <b><u>SR. NO.</u></b> | <b><u>MONITORING STATIONS</u></b>                          | <b><u>LANDMARKS</u></b>                      |
|-----------------------|--|--|
| 1                     | (L1 – SL1) <b>GPS Location:</b> N 21°20.403' E 72°59.063'  | HAZARDOUS WASTE STORAGE AREA                 |
| 2                     | (L2 – SL2) <b>GPS Location:</b> N 21°20.372' E 72°59.086'  | OIL SEPERATOR UBH (NEAR URD)                 |
| 3                     | (L3 – SL3) <b>GPS Location:</b> N 21°20.532', E 72°59.177' | OIL SEPERATOR UBH (SWITCHYARD)               |
| 4                     | (L4 – SL4) <b>GPS Location:</b> N 21°20.322' E 72°59.190'  | BIOCIDE AND CHEMICALS STORAGE BUILDING (UPQ) |
| 5                     | (L5 – SL5) <b>GPS Location:</b> N 21°20.315' E 72°59.270'  | OIL SEPARATOR UBH (NEAR CHILLER BUILDING)    |
| 6                     | (L6 – SL6) <b>GPS Location:</b> N 21°20.303' E 72°59.336'  | WATER TREATMENT CHEMICAL STORAGE (UGD)       |
| 7                     | (L7- SL7) <b>GPS Location:</b> N 21°20.331 E 72°59.320'    | STORAGE OF LUBRICANT & CHEMICAL              |
| 8                     | (L8- SL8) <b>GPS Location:</b> N 21°20.420' E 72°59.272'   | OIL SEPARATOR UBH (OPP. UNIT 20)             |
| 9                     | (L9- SL9) <b>GPS Location:</b> N 21°20.504' E 72°59.325'   | 40 UBF OIL SEPARATOR SUMP ( Unit 40)         |
| 10                    | (L10- SL10) <b>GPS Location:</b> N 21°20.592' E 72°59.274' | SWITCHYARD (GIS) OIL SUMP ( Unit 40)         |
| 11                    | (L11- SL11) <b>GPS Location:</b> N 21°20.448' E 72°59.471' | 40UPQ  |
| 12                    | (L12- SL12) <b>GPS Location:</b> N 21°20.324' E 72°59.387' | 40UGD  |

### **ANALYSIS METHOD DETAILS:**

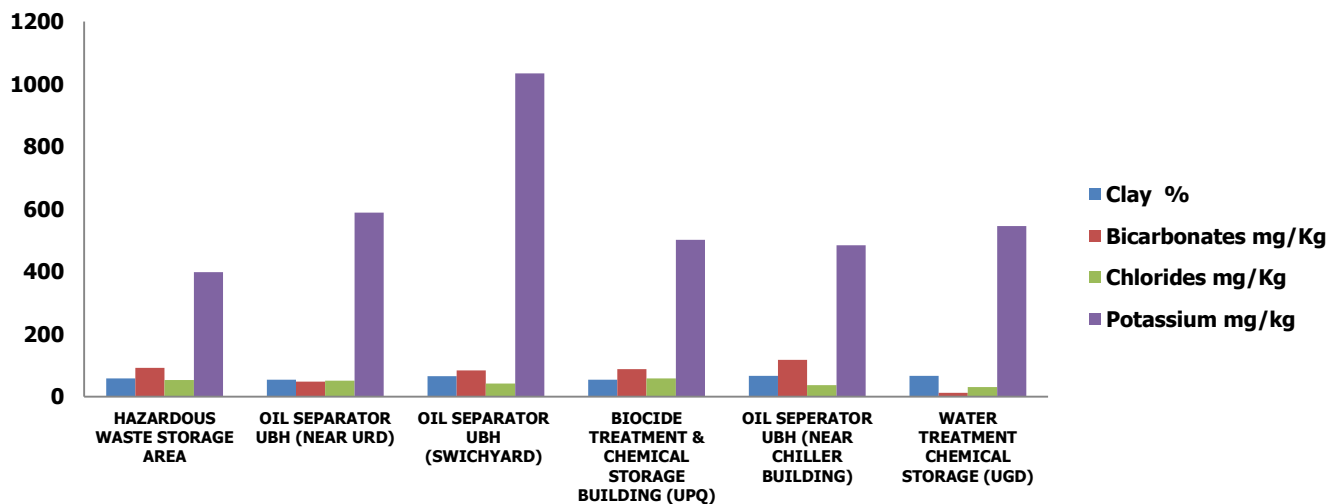
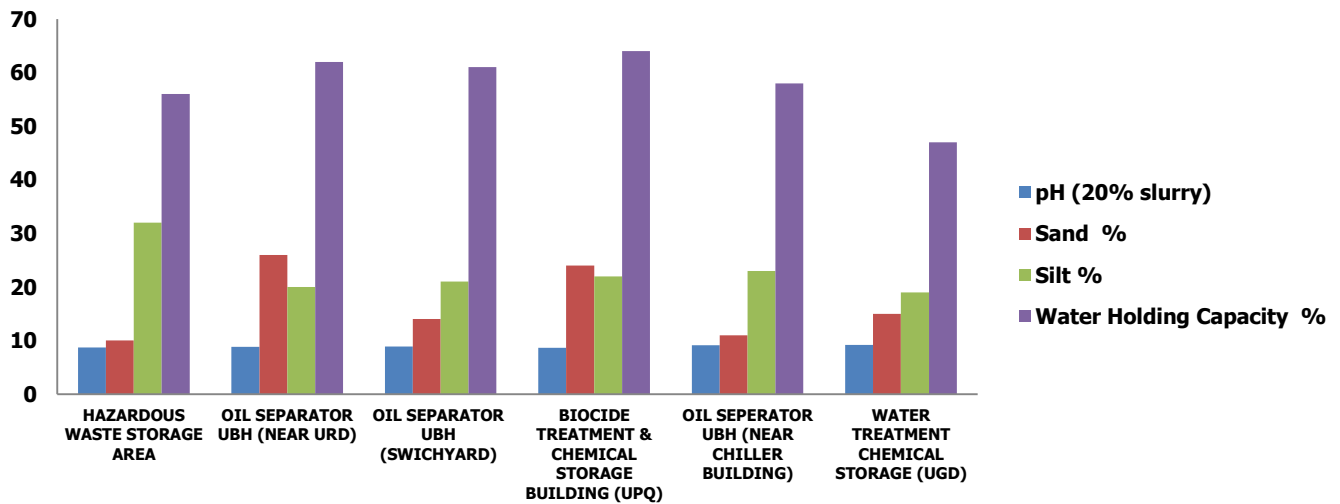
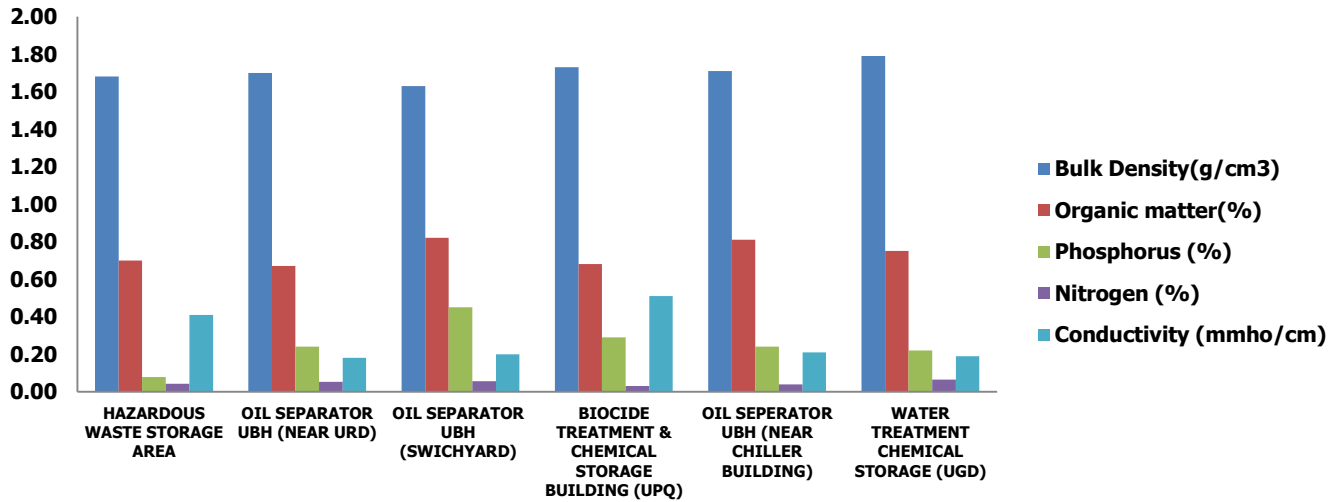
| <b><u>SR. NO.</u></b> | <b><u>TEST PARAMETER</u></b> | <b><u>UNIT</u></b> | <b><u>Minimum Detection Limit</u></b> | <b><u>REFERENCE</u></b> |
|-----------------------|------------------------------|--------------------|---------------------------------------|-------------------------|
| 1                     | Bulk Density                 | g/cm <sup>3</sup>  | --                                    | USDA / IS 2720 etc.     |
| 2                     | Organic matter               | %                  | 0.2                                   |                         |
| 3                     | Water Holding Capacity       | %                  | 2                                     |                         |
| 4                     | Colour                       | --                 | --                                    |                         |
| 5                     | pH (20% slurry)              | --                 | --                                    |                         |
| 6                     | Clay                         | %                  | --                                    |                         |
| 7                     | Silt                         | %                  | --                                    |                         |
| 8                     | Sand                         | %                  | --                                    |                         |
| 9                     | Bicarbonates                 | mg/Kg              | 50                                    |                         |
| 10                    | Chlorides                    | mg/Kg              | 5                                     |                         |
| 11                    | Conductivity                 | µmho/cm            | --                                    |                         |
| 12                    | Potassium                    | mg/kg              | 5                                     |                         |
| 13                    | Phosphorus                   | %                  | 0.05                                  |                         |
| 14                    | Nitrogen                     | %                  | 0.02                                  |                         |

### 6.1 RESULTS OF SOIL QUALITY MONITORING [JUNE 2023]

| SR NO | PARAMETER                                   | UNIT              | RESULT                        |                              |                               |   |   |  |
|-------|---|-------------------|-------------------------------|------------------------------|-------------------------------|---|---|--|
|       |   |                   | Monitoring Date: [21/06/2023] |                              |                               |   |   |  |
|       |   |                   | SL1                           | SL2                          | SL3                           | SL4   | SL5                                       | SL6                                    |
|       |   |                   | HAZARDOUS WASTE STORAGE AREA  | OIL SEPARATOR UBH (NEAR URD) | OIL SEPARATOR UBH (SWICHYARD) | BIOCIDE TREATMENT & CHEMICAL STORAGE BUILDING (UPQ) | OIL SEPERATOR UBH (NEAR CHILLER BUILDING) | WATER TREATMENT CHEMICAL STORAGE (UGD) |
| 1     | Bulk Density                                | g/cm <sup>3</sup> | 1.68                          | 1.70                         | 1.63                          | 1.73  | 1.71                                      | 1.79                                   |
| 2     | Organic matter                              | %                 | 0.70                          | 0.67                         | 0.82                          | 0.68  | 0.81                                      | 0.75                                   |
| 3     | Water Holding Capacity                      | %                 | 56                            | 62                           | 61                            | 64  | 58  | 47                                     |
| 4     | pH (20% slurry)                             | --                | 8.73                          | 8.81                         | 8.92                          | 8.68  | 9.15                                      | 9.18                                   |
| 5     | Colour                                      | --                | Light Brown                   | Brown                        | Brown                         | Reddish brown                                       | Brown                                     | Brown                                  |
| 6     | <b>Texture</b>                              |                   |                               |                              |                               |   |   |  |
| 6.1   | Clay  | %                 | 58                            | 54                           | 65                            | 54  | 66  | 66                                     |
| 6.2   | Silt  | %                 | 32                            | 20                           | 21                            | 22  | 23  | 19                                     |
| 6.3   | Sand  | %                 | 10                            | 26                           | 14                            | 24  | 11  | 15                                     |
| 7     | Bicarbonates                                | mg/Kg             | 92                            | 48                           | 84                            | 88  | 118                                       | 12                                     |
| 8     | Chlorides                                   | mg/kg             | 53.48                         | 50.90                        | 41.99                         | 58.48   | 36.99                                     | 30.49                                  |
| 9     | Conductivity                                | mmho/cm           | 0.410                         | 0.180                        | 0.200                         | 0.510   | 0.210                                     | 0.190                                  |
| 10    | Potassium                                   | mg/kg             | 398                           | 589                          | 1034                          | 502   | 484                                       | 546                                    |
| 11    | Phosphorus as P <sub>2</sub> O <sub>5</sub> | %                 | 0.079                         | 0.240                        | 0.450                         | 0.290   | 0.240                                     | 0.220                                  |
| 12    | Nitrogen                                    | %                 | 0.042                         | 0.053                        | 0.057                         | 0.031   | 0.039                                     | 0.064                                  |



**ANALYSIS RESULT OF SOIL [JUNE 2023]**



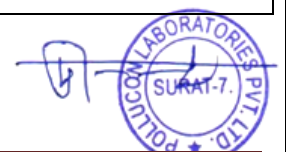
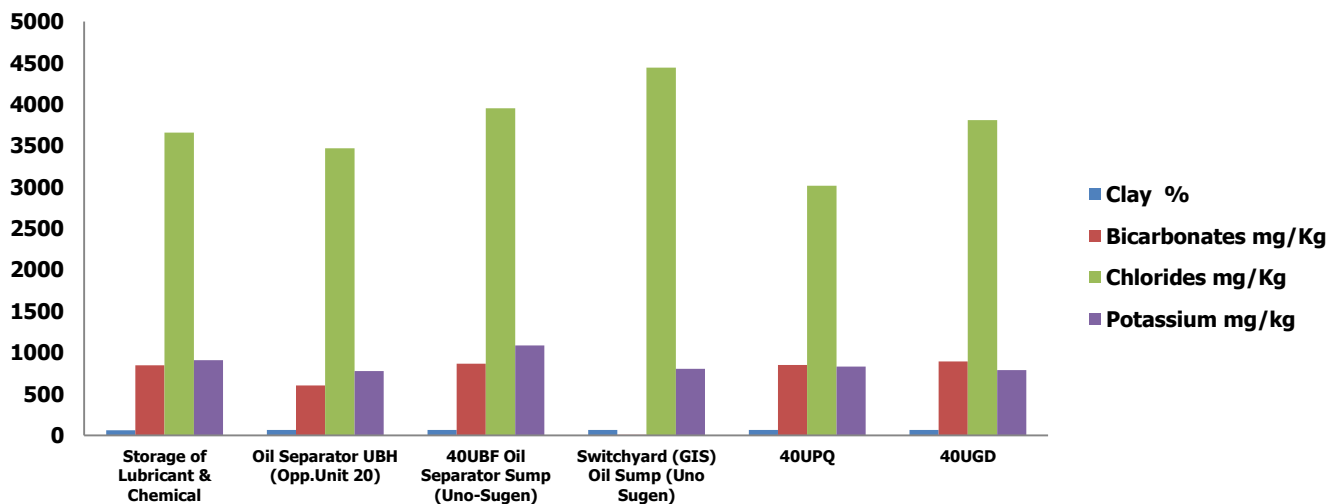
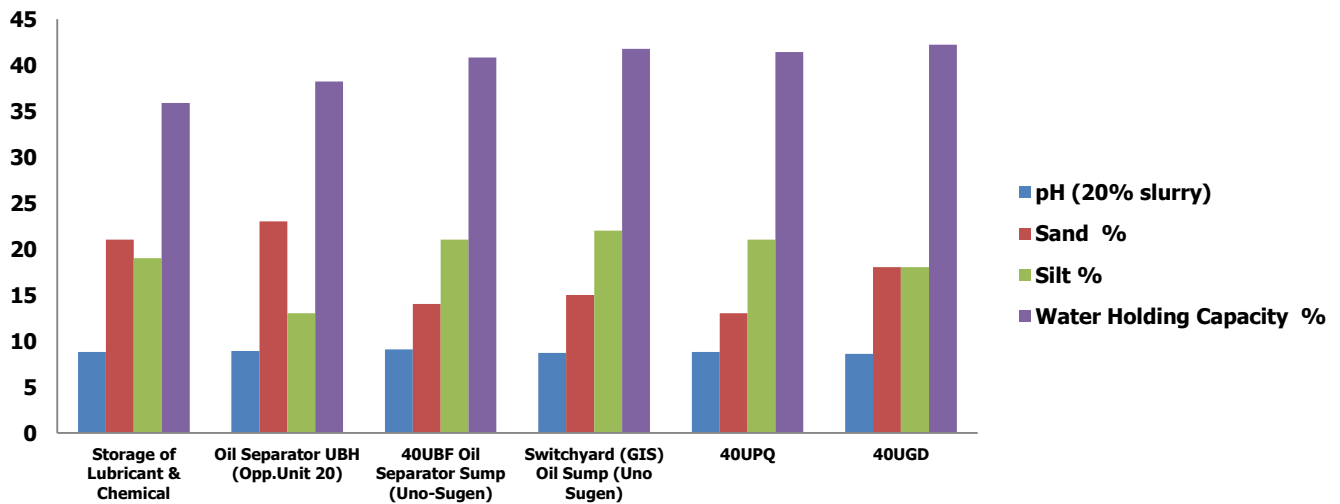
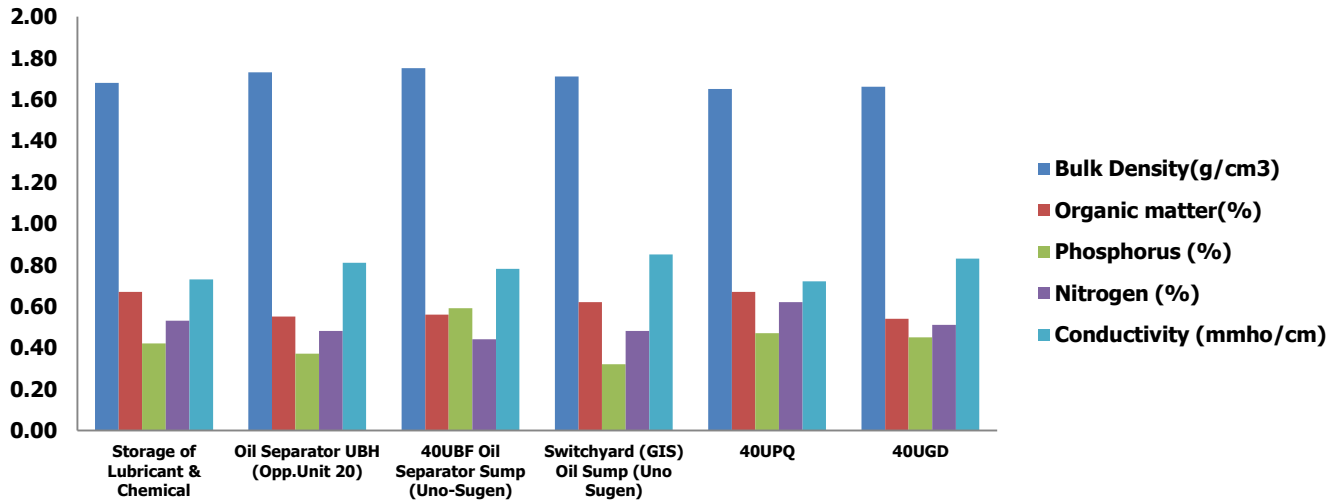
Signature and Stamp of Pollcon Laboratories Pvt. Ltd. Surat-7.



**6.1 RESULTS OF SOIL QUALITY MONITORING [JULY 2023]**

| SR NO | PARAMETER                                   | UNIT              | RESULT                          |                                 |                                      |                                       |                 |            |
|-------|---|-------------------|---------------------------------|---------------------------------|--------------------------------------|---------------------------------------|-----------------|------------|
|       |   |                   | Monitoring Date: [19/07/2023]   |                                 |                                      |                                       |                 |            |
|       |   |                   | SL7                             | SL8                             | SL9                                  | SL10                                  | SL11            | SL12       |
|       |   |                   | STORAGE OF LUBRICANT & CHEMICAL | OIL SEPARATOR UBH (OPP.UNIT 20) | 40UBF OIL SEPARATOR SUMP (UNO-SUGEN) | SWITCHYARD (GIS) OIL SUMP (UNO SUGEN) | 40UPQ           | 40UGD      |
| 1     | Bulk Density                                | g/cm <sup>3</sup> | 1.68                            | 1.73                            | 1.75                                 | 1.71                                  | 1.65            | 1.66       |
| 2     | Organic matter                              | %                 | 0.67                            | 0.55                            | 0.56                                 | 0.62                                  | 0.67            | 0.54       |
| 3     | Water Holding Capacity                      | %                 | 35.86                           | 38.2                            | 40.8                                 | 41.74                                 | 41.4            | 42.2       |
| 4     | pH (20% slurry)                             | --                | 8.79                            | 8.89                            | 9.06                                 | 8.68                                  | 8.81            | 8.57       |
| 5     | Colour                                      | --                | Brown                           | Dark Brown                      | Light Brown                          | Brown                                 | Yellowish Brown | Dark Brown |
| 6     | <b>Texture</b>                              |                   |                                 |                                 |                                      |                                       |                 |            |
| 6.1   | Clay  | %                 | 60                              | 64                              | 65                                   | 63                                    | 66              | 64         |
| 6.2   | Silt  | %                 | 19                              | 13                              | 21                                   | 22                                    | 21              | 18         |
| 6.3   | Sand  | %                 | 21                              | 23                              | 14                                   | 15                                    | 13              | 18         |
| 7     | Bicarbonates                                | mg/Kg             | 844                             | 602                             | 866                                  | 7                                     | 849             | 893        |
| 8     | Chlorides                                   | mg/kg             | 3658                            | 3466                            | 3952                                 | 4440                                  | 3016            | 3808       |
| 9     | Conductivity                                | mmho/cm           | 0.730                           | 0.810                           | 0.780                                | 0.850                                 | 0.720           | 0.830      |
| 10    | Potassium                                   | mg/kg             | 906                             | 775                             | 1086                                 | 802                                   | 830             | 786        |
| 11    | Phosphorus as P <sub>2</sub> O <sub>5</sub> | %                 | 0.420                           | 0.370                           | 0.590                                | 0.320                                 | 0.470           | 0.450      |
| 12    | Nitrogen                                    | %                 | 0.53                            | 0.48                            | 0.44                                 | 0.48                                  | 0.62            | 0.51       |

**ANALYSIS RESULT OF SOIL [JULY 2023]**



## **CHAPTER 7**

### **7.0 RESULTS OF NOISE MONITORING**

**MONITORING PERIOD: APRIL 2023 TO SEPTEMBER 2023**

## **7.0 NOISE LEVEL MONITORING**

### **MONITORING DETAILS:**

| <b>SR. NO.</b> | <b>MONITORING STATIONS</b>                                  | <b>LANDMARKS</b>                                  |
|----------------|---|---|
| 1              | (L1 - N1) <b>GPS Location:</b> N 21°20.370' E 072°59.462'   | Boundary wall at Back Side of GSPL gas station    |
| 2              | (L2 - N2) <b>GPS Location:</b> N 21°20.279' E 072°59.365'   | Boundary wall at Back Side Maintenance Lay Down   |
| 3              | (L3 - N3) <b>GPS Location:</b> N 21°20.237' E 072°59.252'   | Boundary wall at Backside of fire water reservoir |
| 4              | (L4 - N4) <b>GPS Location:</b> N 21°20.682' E 072°59.579'   | Near Sukan : AAQM Station                         |
| 5              | (L5 - N5) <b>GPS Location:</b> N 21°20.686' E 072°59.112'   | Boundary wall at Barrier Gate : 2 - Tejpath       |
| 6              | (L6 - N6) <b>GPS Location:</b> N 21°20.439' E 072°59.981'   | Boundary wall at Banyan tree Gate to satkar       |
| 7              | (L7 - N7) <b>GPS Location:</b> N 21°19.889'E 072°58.867'    | Shardashish : Nr. Ashok Circle -Pond gate         |
| 8              | (L8 - N8) <b>GPS Location:</b> N 21°19.87' E 072°59.092'    | Shardashish : Akhakhol Gate                       |
| 9              | (L9 - N9) <b>GPS Location:</b> N 21°19.518' E 072°59.440'   | Near Swagat Gate                                  |
| 10             | (L10 - N10) <b>GPS Location:</b> N 21°19.19' E 072°58.871'  | Surbhi  |
| 11             | (L11 - N11) <b>GPS Location:</b> N 21°20.175'E 072°59.362'  | Akhakhol Village                                  |
| 12             | (L12 - N12) <b>GPS Location:</b> N 21°19.798' E 072°57.541' | NaviPardi Village                                 |
| 13             | (L13 - N13) <b>GPS Location:</b> N 21°20.439' E 072°59.527' | Unit-40 Entry Gate - East Side                    |
| 14             | (L14 - N14) <b>GPS Location:</b> N 21°20.823'E 072°59.233'  | Tejpath Turn - West Side Of Sanman Circle         |

### **THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2010**

| <b>LIMIT</b>   | <b>Day Time</b> | <b>Night Time</b> |
|--|-----------------|-------------------|
| Ambient Air Quality Standards in respect of Noise for Industrial Area  | 75 dB[A]        | 70 dB[A]          |
| Ambient Air Quality Standards in respect of Noise for Residential Area | 55 dB[A]        | 45 dB[A]          |
| Ambient Air Quality Standards in respect of Noise for Silence Zone     | 50 dB[A]        | 40 dB[A]          |

Note Silence zone is defined as an area comprising not less than 100 meters around hospitals, educational institutions and courts.

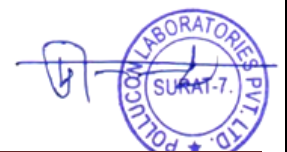
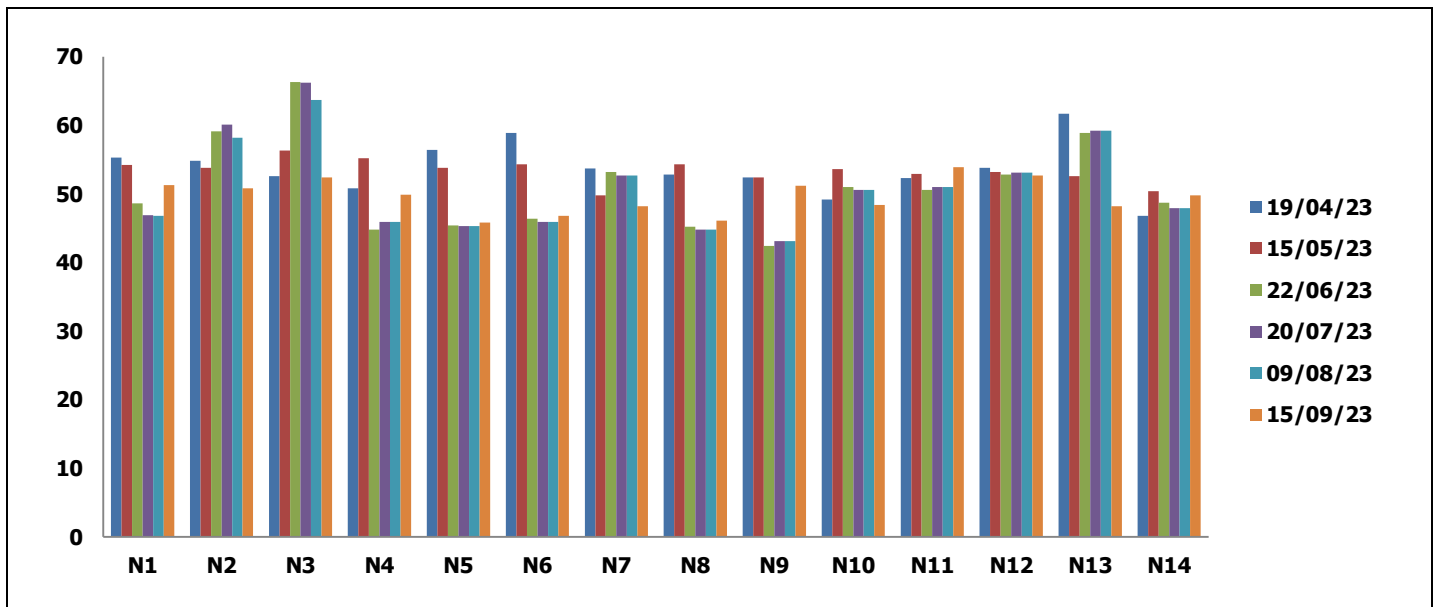
The silence zones are zones which are declared as such by the competent authority.

1. Day time shall mean from 6.00 a.m. to 10.00 p.m.
2. Night time shall mean from 10.00 p.m. to 6.00 a.m.

**7.1 RESULTS OF NOISE MONITORING [APRIL 2023 TO SEPTEMBER 2023]**

| SR NO | PARAMETER  | NOISE MONITORING – dB(A) [DAY TIME] |          |          |          |          |          |
|-------|--|-------------------------------------|----------|----------|----------|----------|----------|
|       |  | 19/04/23                            | 15/05/23 | 22/06/23 | 20/07/23 | 09/08/23 | 15/09/23 |
| 1     | N1 # Boundary wall at Back Side of GSPL gas station    | 55.3                                | 54.2     | 48.6     | 46.9     | 46.8     | 51.3     |
| 2     | N2 # Boundary wall at Back Side Maintenance Lay Down   | 54.8                                | 53.8     | 59.1     | 60.1     | 58.2     | 50.8     |
| 3     | N3 # Boundary wall at Backside of fire water reservoir | 52.6                                | 56.3     | 66.3     | 66.2     | 63.7     | 52.4     |
| 4     | N4 # Nr. Sukan : AAQM Station                          | 50.8                                | 55.2     | 44.8     | 45.9     | 45.9     | 49.9     |
| 5     | N5 # Boundary wall at Barrier Gate : 2 - Tejpath       | 56.4                                | 53.8     | 45.4     | 45.3     | 45.3     | 45.8     |
| 6     | N6 # Boundary wall at Banyan tree Gate to satkar       | 58.9                                | 54.3     | 46.4     | 45.9     | 45.9     | 46.8     |
| 7     | N7 # Shardashish : Nr. Ashok Circle –Pond gate         | 53.7                                | 49.8     | 53.2     | 52.7     | 52.7     | 48.2     |
| 8     | N8 # Shardashish : Akhakhol Gate                       | 52.8                                | 54.3     | 45.2     | 44.8     | 44.8     | 46.1     |
| 9     | N9 # Near Swagat Gate                                  | 52.4                                | 52.4     | 42.4     | 43.1     | 43.1     | 51.2     |
| 10    | N10 # Surbhi   | 49.2                                | 53.6     | 51.0     | 50.6     | 50.6     | 48.4     |
| 11    | N11 # Akhakhol Village                                 | 52.3                                | 52.9     | 50.6     | 51.0     | 51.0     | 53.9     |
| 12    | N12 # NaviPardi Village                                | 53.8                                | 53.2     | 52.8     | 53.1     | 53.1     | 52.7     |
| 13    | N13 # Entry Gate - East Side                           | 61.7                                | 52.6     | 58.9     | 59.2     | 59.2     | 48.2     |
| 14    | N14 # Tejpath Turn – West Side Of Sanman Circle        | 46.8                                | 50.4     | 48.7     | 47.9     | 47.9     | 49.8     |

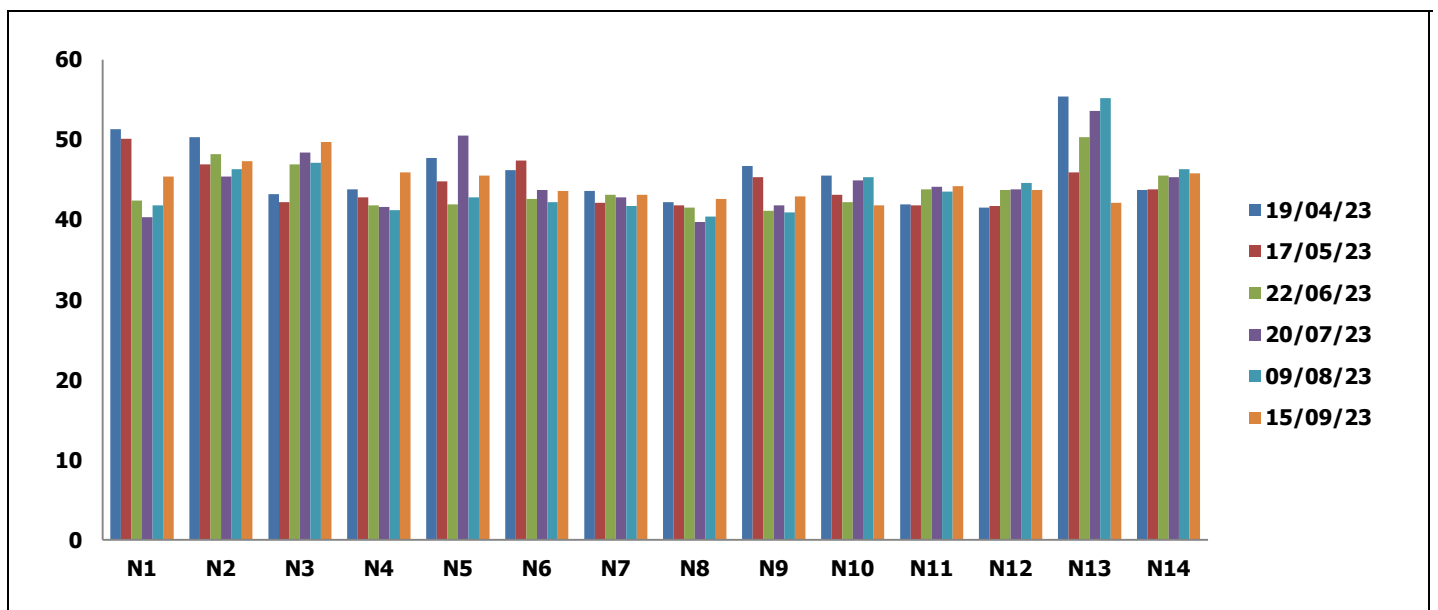
**NOISE MONITORING OBSERVATION dB(A) [DAY TIME] APRIL 2023 TO SEPTEMBER 2023**



**7.2 RESULTS OF NOISE MONITORING [APRIL 2023 TO SEPTEMBER 2023]**

| SR NO | PARAMETER  | NOISE MONITORING – dB(A) [NIGHT TIME] |          |          |          |          |          |
|-------|--|---------------------------------------|----------|----------|----------|----------|----------|
|       |  | 19/04/23                              | 15/05/23 | 22/06/23 | 20/07/23 | 09/08/23 | 15/09/23 |
| 1     | N1 # Boundary wall at Back Side of GSPL gas station    | 51.3                                  | 50.1     | 42.4     | 40.3     | 41.8     | 45.4     |
| 2     | N2 # Boundary wall at Back Side Maintenance Lay Down   | 50.3                                  | 46.9     | 48.2     | 45.4     | 46.3     | 47.3     |
| 3     | N3 # Boundary wall at Backside of fire water reservoir | 43.2                                  | 42.2     | 46.9     | 48.4     | 47.1     | 49.7     |
| 4     | N4 # Nr. Sukan : AAQM Station                          | 43.8                                  | 42.8     | 41.8     | 41.6     | 41.2     | 45.9     |
| 5     | N5 # Boundary wall at Barrier Gate : 2 - Tejpath       | 47.7                                  | 44.8     | 41.9     | 50.5     | 42.8     | 45.5     |
| 6     | N6 # Boundary wall at Banyan tree Gate to satkar       | 46.2                                  | 47.4     | 42.6     | 43.7     | 42.2     | 43.6     |
| 7     | N7 # Shardashish : Nr. Ashok Circle –Pond gate         | 43.6                                  | 42.1     | 43.1     | 42.8     | 41.7     | 43.1     |
| 8     | N8 # Shardashish : Akhakhhol Gate                      | 42.2                                  | 41.8     | 41.5     | 39.7     | 40.4     | 42.6     |
| 9     | N9 # Near Swagat Gate                                  | 46.7                                  | 45.3     | 41.1     | 41.8     | 40.9     | 42.9     |
| 10    | N10 # Surbhi   | 45.5                                  | 43.1     | 42.2     | 44.9     | 45.3     | 41.8     |
| 11    | N11 # Akhakhhol Village                                | 41.9                                  | 41.8     | 43.8     | 44.1     | 43.5     | 44.2     |
| 12    | N12 # NaviPardi Village                                | 41.5                                  | 41.7     | 43.7     | 43.8     | 44.6     | 43.7     |
| 13    | N13 # Entry Gate - East Side                           | 55.4                                  | 45.9     | 50.3     | 53.6     | 55.2     | 42.1     |
| 14    | N14 # Tejpath Turn – West Side Of Sanman Circle        | 43.7                                  | 43.8     | 45.5     | 45.3     | 46.3     | 45.8     |

**NOISE MONITORING OBSERVATION dB(A) [NIGHT TIME] APRIL 2023 TO SEPTEMBER 2023**



## **CHAPTER 8**

### **8.0 RESULTS OF PLANT STACK EMISSION MONITORING**

**MONITORING PERIOD: APRIL 2023 TO SEPTEMBER 2023**

## **8.0 PLANT STACKEMISSION MONITORING:**

### **LOCATION DETAILS**

| <b>SR. NO.</b> | <b>MONITORING STATIONS</b>                                   | <b>LANDMARKS</b>                             |
|----------------|--|--|
| 1              | (L1 - SM1) <b>GPS Location:</b> N 21°20.340' , E 72°59.342'  | Heat recovery and Steam Generation 10 UHA    |
| 2              | (L2 - SM 2) <b>GPS Location:</b> N 21°20.364' , E 72°59.349' | Heat recovery and Steam Generation 20 UHA    |
| 3              | (L3 - SM 3) <b>GPS Location:</b> N 21°20.408' , E 72°59.367' | Heat recovery and Steam Generation 30 UHA    |
| 4              | (L4 - SM 4) <b>GPS Location:</b> N 21°20.445' , E 72°59.384' | Heat recovery and Steam Generation 40 UHA    |
| 5              | (L5 - SM 5) <b>GPS Location:</b> N 21°20.369' , E 72°59.422' | Natural Gas Dew Point Water Heater 00EKT01   |
| 6              | (L6 - SM 6) <b>GPS Location:</b> N 21°20.370' , E 72°59.424' | Natural Gas Dew Point Water Heater 00EKT02   |
| 7              | (L7 - SM 7) <b>GPS Location:</b> N 21°20.394' , E 72°59.398' | Natural Gas Dew Point Water Heater-1 40EKT01 |
| 8              | (L8 - SM 8) <b>GPS Location:</b> N 21°20.392' , E 72°59.402' | Natural Gas Dew Point Water Heater-2 40EKT02 |

### **DETAILS OF ANALYSIS METHOD:**

| <b>SR. NO.</b> | <b>TEST PARAMETER</b>                | <b>UNIT</b>        | <b>GPCB LIMIT</b> | <b>TEST/SAMPLING METHOD</b> |
|----------------|--------------------------------------|--------------------|-------------------|-----------------------------|
| 1              | Particulate Matter                   | mg/Nm <sup>3</sup> | 150               | IS:11255 (Part-1)           |
| 2              | Sulfur dioxide (as SO <sub>2</sub> ) | ppm                | 100               | IS:11255 (Part-2)           |
| 3              | Oxides of Nitrogen                   | ppm                | 50                | IS:11255 (Part-7)           |



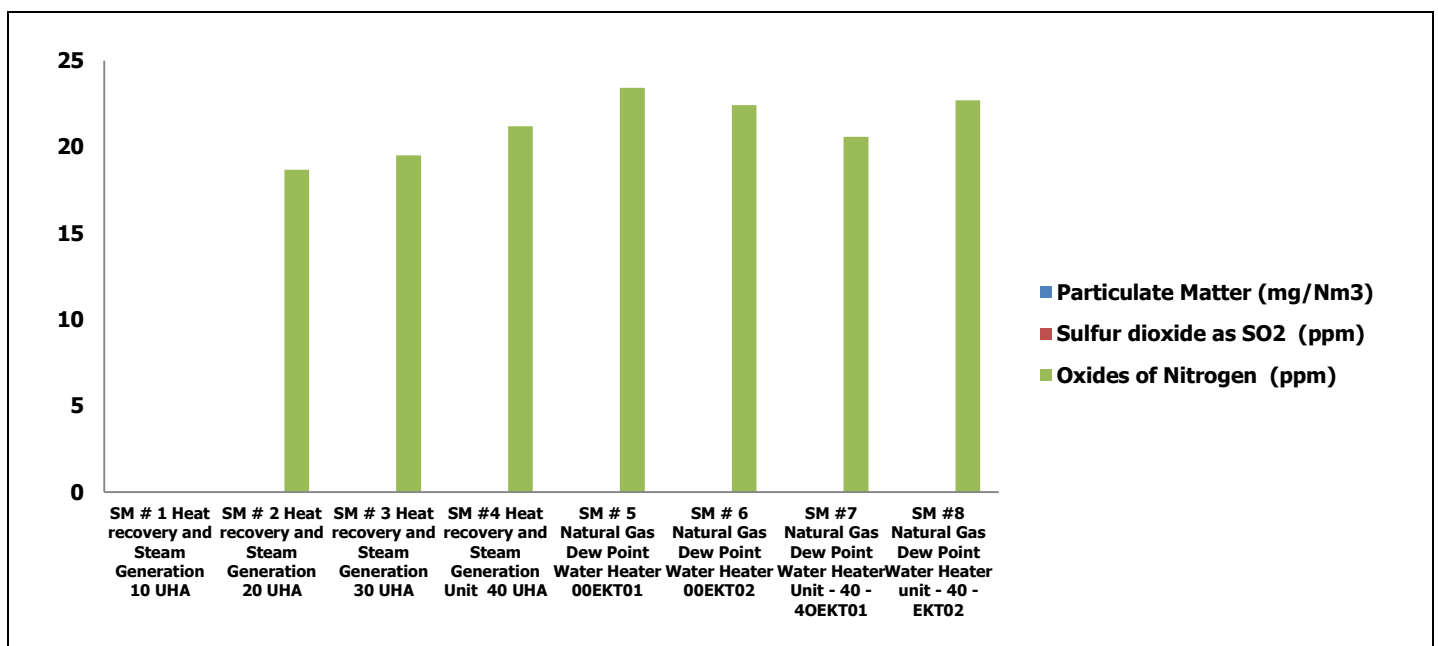


**TABLE 8.1: RESULTS OF STACK ANALYSIS [APRIL 2023]**

| SR. NO. | TEST PARAMETERS                          | SM # 1 Heat recovery and Steam Generation Unit 10 UHA | SM # 2 Heat recovery and Steam Generation Unit 20 UHA | SM # 3 Heat recovery and Steam Generation Unit 30 UHA | SM #4 Heat recovery and Steam Generation Unit 40 UHA |
|---------|--|---|---|---|--|
|         |  | --  | 19/04/2023  | 19/04/2023  | 19/04/2023   |
| 1       | Particulate Matter (mg/Nm <sup>3</sup> ) | --  | Not Detected  | Not Detected  | Not Detected   |
| 2       | Sulfur dioxide as SO <sub>2</sub> (ppm)  | --  | Not Detected  | Not Detected  | Not Detected   |
| 3       | Oxides of Nitrogen (ppm)                 | --  | 18.67   | 19.51   | 21.20  |

| SR. NO. | TEST PARAMETERS                          | SM # 5 Natural Gas Dew Point Water Heater 00EKT01 | SM # 6 Natural Gas Dew Point Water Heater 00EKT02 | SM #7 Natural Gas Dew Point Water Heater Unit - 40 - 40EKT01 | SM #8 Natural Gas Dew Point Water Heater Unit - 40 - 40EKT02 |
|---------|--|---|---|--|--|
|         |  | 19/04/2023  | 19/04/2023  | 19/04/2023   | 19/04/2023   |
| 1       | Particulate Matter (mg/Nm <sup>3</sup> ) | Not Detected                                      | Not Detected                                      | Not Detected   | Not Detected   |
| 2       | Sulfur dioxide as SO <sub>2</sub> (ppm)  | Not Detected                                      | Not Detected                                      | Not Detected   | Not Detected   |
| 3       | Oxides of Nitrogen (ppm)                 | 23.41   | 22.42   | 20.58  | 22.70  |

**ANALYSIS RESULT OF PLANT STACK [APRIL 2023]**



ND\*: Below detection limit: PM: 10 mg/Nm<sup>3</sup>, Sulfur dioxide (as SO<sub>2</sub>): 0.76 ppm.

Results on 11 % O<sub>2</sub> Correction when Oxygen is greater than 11 % and 12 % CO<sub>2</sub> Correction when CO<sub>2</sub> is less than 12 %

SM#1 was not in operation during monitoring.

PM for SM#2, 3, 4, 5, 6, 7, 8 & SO<sub>2</sub> for SM#2, 3, 4, 5, 6, 7, 8 are Below Detection Limit.

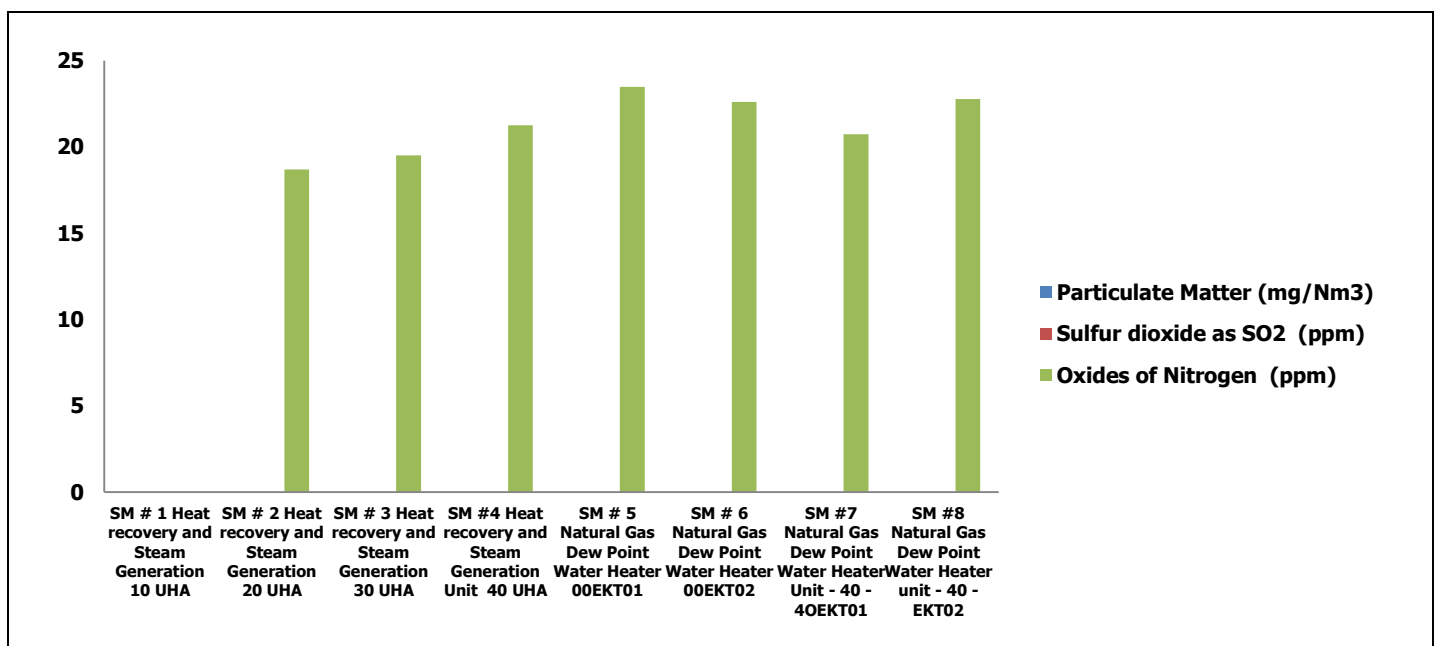


**TABLE 8.2: RESULTS OF STACK ANALYSIS [MAY 2023]**

| SR. NO. | TEST PARAMETERS                          | SM # 1 Heat recovery and Steam Generation Unit 10 UHA | SM # 2 Heat recovery and Steam Generation Unit 20 UHA | SM # 3 Heat recovery and Steam Generation Unit 30 UHA | SM #4 Heat recovery and Steam Generation Unit 40 UHA |
|---------|--|---|---|---|--|
|         |  | --  | 15/05/2023  | 16/05/2023  | 16/05/2023   |
| 1       | Particulate Matter (mg/Nm <sup>3</sup> ) | --  | Not Detected  | Not Detected  | Not Detected   |
| 2       | Sulfur dioxide as SO <sub>2</sub> (ppm)  | --  | Not Detected  | Not Detected  | Not Detected   |
| 3       | Oxides of Nitrogen (ppm)                 | --  | 18.68   | 19.50   | 21.25  |

| SR. NO. | TEST PARAMETERS                          | SM # 5 Natural Gas Dew Point Water Heater 00EKT01 | SM # 6 Natural Gas Dew Point Water Heater 00EKT02 | SM #7 Natural Gas Dew Point Water Heater Unit - 40 - 40EKT01 | SM #8 Natural Gas Dew Point Water Heater Unit - 40 - 40EKT02 |
|---------|--|---|---|--|--|
|         |  | 15/05/2023  | 15/05/2023  | 15/05/2023   | 15/05/2023   |
| 1       | Particulate Matter (mg/Nm <sup>3</sup> ) | Not Detected                                      | Not Detected                                      | Not Detected   | Not Detected   |
| 2       | Sulfur dioxide as SO <sub>2</sub> (ppm)  | Not Detected                                      | Not Detected                                      | Not Detected   | Not Detected   |
| 3       | Oxides of Nitrogen (ppm)                 | 23.47   | 22.60   | 20.72  | 22.76  |

**ANALYSIS RESULT OF PLANT STACK [MAY 2023]**



ND\*: Below detection limit: PM: 10 mg/Nm<sup>3</sup>, Sulfur dioxide (as SO<sub>2</sub>): 0.76 ppm.

Results on 11 % O<sub>2</sub> Correction when Oxygen is greater than 11 % and 12 % CO<sub>2</sub> Correction when CO<sub>2</sub> is less than 12 %

SM#1 was not in operation during monitoring.

PM for SM#2, 3, 4, 5, 6, 7, 8 & SO<sub>2</sub> for SM#2, 3, 4, 5, 6, 7, 8 are Below Detection Limit.

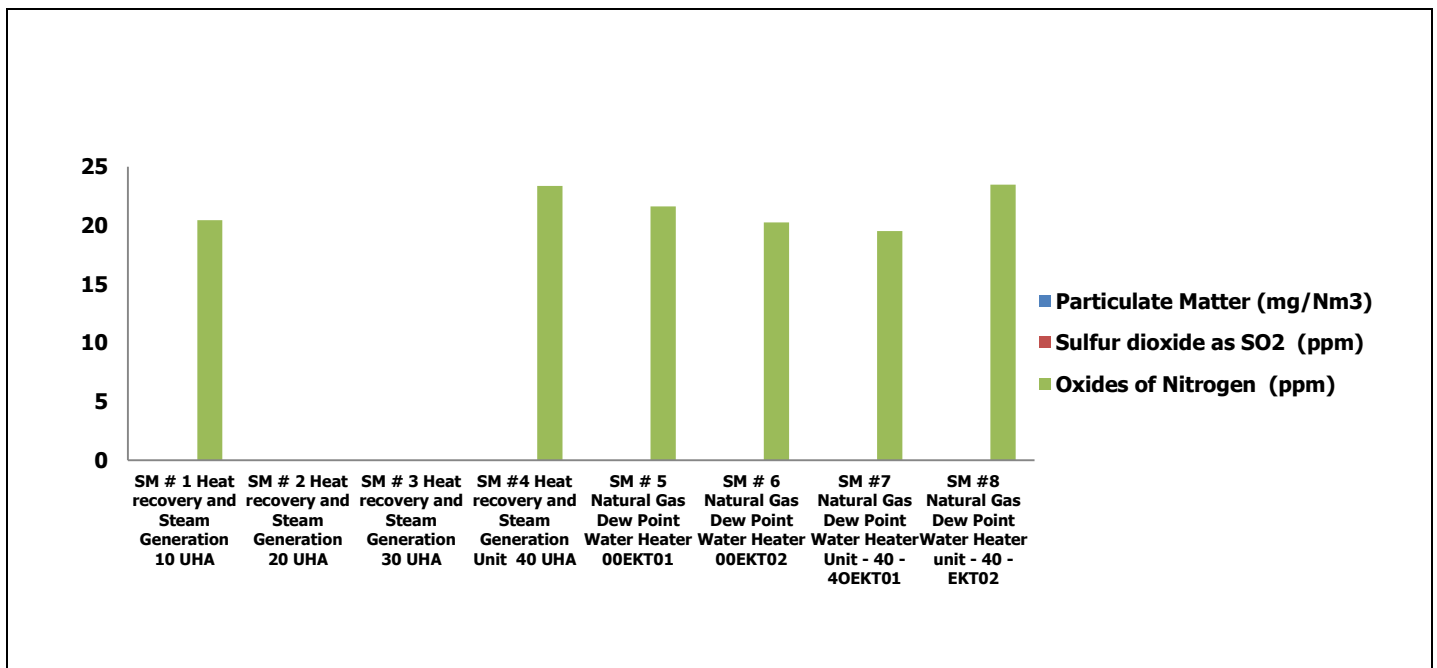


**TABLE 8.3: RESULTS OF STACK ANALYSIS [JUNE 2023]**

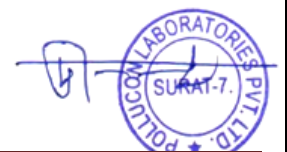
| SR. NO. | TEST PARAMETERS                          | SM # 1 Heat recovery and Steam Generation Unit 10 UHA | SM # 2 Heat recovery and Steam Generation Unit 20 UHA | SM # 3 Heat recovery and Steam Generation Unit 30 UHA | SM # 4 Heat recovery and Steam Generation Unit 40 UHA |
|---------|--|---|---|---|---|
|         |  | 21/06/2023  | --  | --  | 21/06/2023  |
| 1       | Particulate Matter (mg/Nm <sup>3</sup> ) | Not Detected  | --  | --  | Not Detected  |
| 2       | Sulfur dioxide as SO <sub>2</sub> (ppm)  | Not Detected  | --  | --  | Not Detected  |
| 3       | Oxides of Nitrogen (ppm)                 | 20.43   | --  | --  | 23.35   |

| SR. NO. | TEST PARAMETERS                          | SM # 5 Natural Gas Dew Point Water Heater 00EKT01 | SM # 6 Natural Gas Dew Point Water Heater 00EKT02 | SM # 7 Natural Gas Dew Point Water Heater Unit - 40 - 40EKT01 | SM # 8 Natural Gas Dew Point Water Heater Unit - 40 - 40EKT02 |
|---------|--|---|---|---|---|
|         |  | 22/06/2023  | 22/06/2023  | 22/06/2023  | 22/06/2023  |
| 1       | Particulate Matter (mg/Nm <sup>3</sup> ) | Not Detected                                      | Not Detected                                      | Not Detected  | Not Detected  |
| 2       | Sulfur dioxide as SO <sub>2</sub> (ppm)  | Not Detected                                      | Not Detected                                      | Not Detected  | Not Detected  |
| 3       | Oxides of Nitrogen (ppm)                 | 21.62   | 20.24   | 19.50   | 23.45   |

**ANALYSIS RESULT OF PLANT STACK [JUNE 2023]**



ND\*: Below detection limit: PM: 10 mg/Nm<sup>3</sup>, Sulfur dioxide (as SO<sub>2</sub>): 0.76 ppm.  
Results on 11 % O<sub>2</sub> Correction when Oxygen is greater than 11 % and 12 % CO<sub>2</sub> Correction when CO<sub>2</sub> is less than 12 %  
SM#2, 3 was not in operation during monitoring.  
PM for SM#1, 4, 5, 6, 7, 8 & SO<sub>2</sub> for SM#1, 4, 5, 6, 7, 8 are Below Detection Limit.

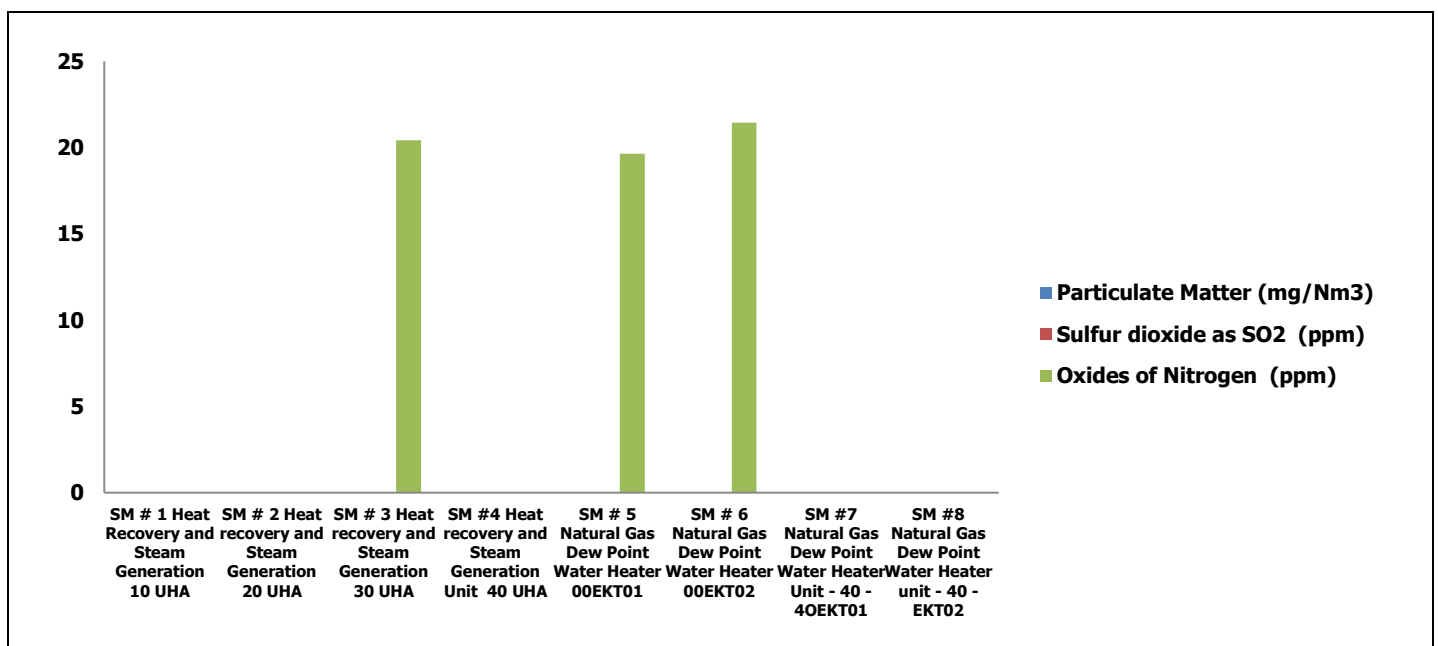


**TABLE 8.4: RESULTS OF STACK ANALYSIS [JULY 2023]**

| SR. NO. | TEST PARAMETERS                          | SM # 1 Heat recovery and Steam Generation Unit 10 UHA | SM # 2 Heat recovery and Steam Generation Unit 20 UHA | SM # 3 Heat recovery and Steam Generation Unit 30 UHA | SM #4 Heat recovery and Steam Generation Unit 40 UHA |
|---------|--|---|---|---|--|
|         |  | --  | --  | 20/07/2023  | --   |
| 1       | Particulate Matter (mg/Nm <sup>3</sup> ) | --  | --  | Not Detected  | --   |
| 2       | Sulfur dioxide as SO <sub>2</sub> (ppm)  | --  | --  | Not Detected  | --   |
| 3       | Oxides of Nitrogen (ppm)                 | --  | --  | 20.41   | --   |

| SR. NO. | TEST PARAMETERS                          | SM # 5 Natural Gas Dew Point Water Heater 00EKT01 | SM # 6 Natural Gas Dew Point Water Heater 00EKT02 | SM #7 Natural Gas Dew Point Water Heater Unit - 40 - 40EKT01 | SM #8 Natural Gas Dew Point Water Heater Unit - 40 - 40EKT02 |
|---------|--|---|---|--|--|
|         |  | 20/07/2023  | 20/07/2023  | --   | --   |
| 1       | Particulate Matter (mg/Nm <sup>3</sup> ) | Not Detected                                      | Not Detected                                      | --   | --   |
| 2       | Sulfur dioxide as SO <sub>2</sub> (ppm)  | Not Detected                                      | Not Detected                                      | --   | --   |
| 3       | Oxides of Nitrogen (ppm)                 | 19.63   | 21.44   | --   | --   |

**ANALYSIS RESULT OF PLANT STACK [JULY 2023]**



ND\*: Below detection limit: PM: 10 mg/Nm<sup>3</sup>, Sulfur dioxide (as SO<sub>2</sub>): 0.76 ppm.

Results on 11 % O<sub>2</sub> Correction when Oxygen is greater than 11 % and 12 % CO<sub>2</sub> Correction when CO<sub>2</sub> is less than 12 %

SM#1, 2, 4, 7, 8 was not in operation during monitoring.

PM for SM#3, 5, 6 & SO<sub>2</sub> for SM#3, 5, 6 are Below Detection Limit.

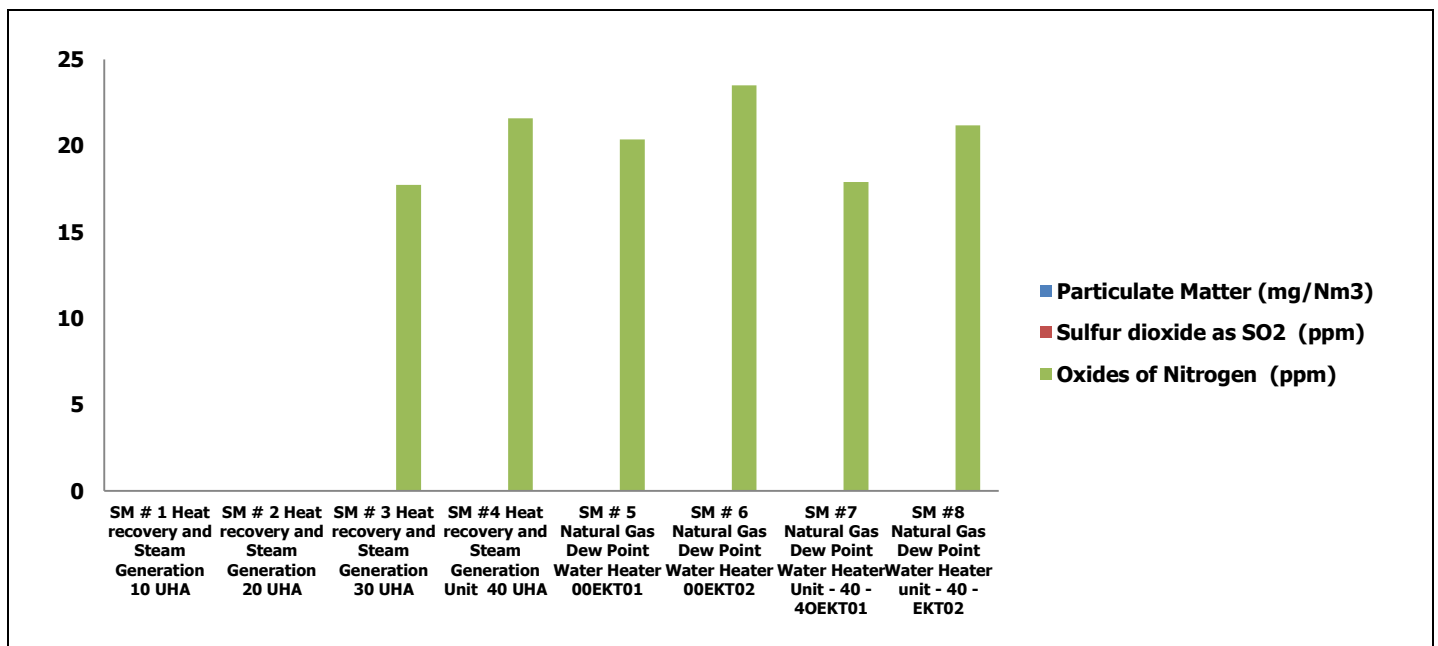


**TABLE 8.5: RESULTS OF STACK ANALYSIS [AUGUST 2023]**

| SR. NO. | TEST PARAMETERS                          | SM # 1 Heat recovery and Steam Generation Unit 10 UHA | SM # 2 Heat recovery and Steam Generation Unit 20 UHA | SM # 3 Heat recovery and Steam Generation Unit 30 UHA | SM # 4 Heat recovery and Steam Generation Unit 40 UHA |
|---------|--|---|---|---|---|
|         |  | --  | --  | 08/08/2023  | 08/08/2023  |
| 1       | Particulate Matter (mg/Nm <sup>3</sup> ) | --  | --  | Not Detected  | Not Detected  |
| 2       | Sulfur dioxide as SO <sub>2</sub> (ppm)  | --  | --  | Not Detected  | Not Detected  |
| 3       | Oxides of Nitrogen (ppm)                 | --  | --  | 17.72   | 21.58   |

| SR. NO. | TEST PARAMETERS                          | SM # 5 Natural Gas Dew Point Water Heater 00EKT01 | SM # 6 Natural Gas Dew Point Water Heater 00EKT02 | SM # 7 Natural Gas Dew Point Water Heater Unit - 40 - 40EKT01 | SM # 8 Natural Gas Dew Point Water Heater Unit - 40 - 40EKT02 |
|---------|--|---|---|---|---|
|         |  | 09/08/2023  | 09/08/2023  | 09/08/2023  | 09/08/2023  |
| 1       | Particulate Matter (mg/Nm <sup>3</sup> ) | Not Detected                                      | Not Detected                                      | Not Detected  | Not Detected  |
| 2       | Sulfur dioxide as SO <sub>2</sub> (ppm)  | Not Detected                                      | Not Detected                                      | Not Detected  | Not Detected  |
| 3       | Oxides of Nitrogen (ppm)                 | 20.36   | 23.49   | 17.89   | 21.17   |

**ANALYSIS RESULT OF PLANT STACK [AUGUST 2023]**



ND\*: Below detection limit: PM: 10 mg/Nm<sup>3</sup>, Sulfur dioxide (as SO<sub>2</sub>): 0.76 ppm.

Results on 11 % O<sub>2</sub> Correction when Oxygen is greater than 11 % and 12 % CO<sub>2</sub> Correction when CO<sub>2</sub> is less than 12 %

SM#1, 2 was not in operation during monitoring.

PM for SM#3, 4, 5, 6, 7, 8 & SO<sub>2</sub> for SM#3, 4, 5, 6, 7, 8 are Below Detection Limit.

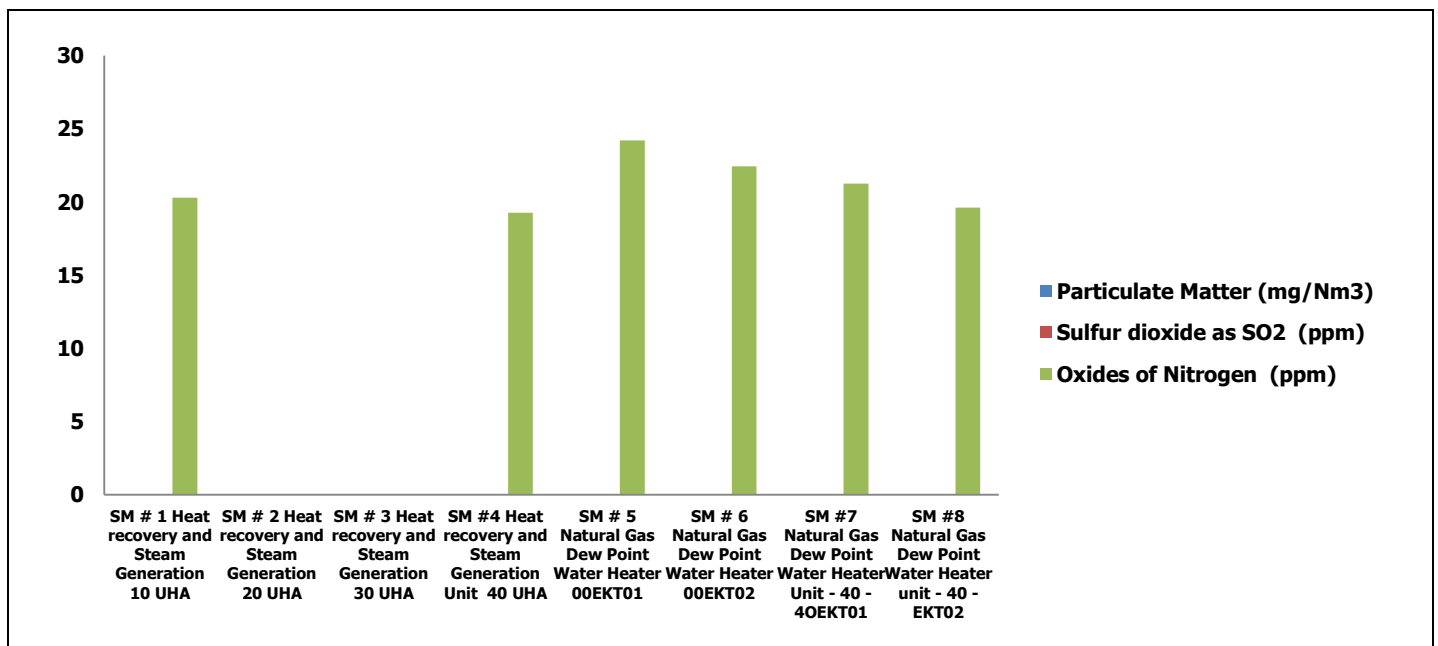


**TABLE 8.6: RESULTS OF STACK ANALYSIS [SEPTEMBER 2023]**

| SR. NO. | TEST PARAMETERS                          | SM # 1 Heat recovery and Steam Generation Unit 10 UHA | SM # 2 Heat recovery and Steam Generation Unit 20 UHA | SM # 3 Heat recovery and Steam Generation Unit 30 UHA | SM # 4 Heat recovery and Steam Generation Unit 40 UHA |
|---------|--|---|---|---|---|
|         |  | 15/09/2023  | --  | --  | 15/09/2023  |
| 1       | Particulate Matter (mg/Nm <sup>3</sup> ) | Not Detected  | --  | --  | Not Detected  |
| 2       | Sulfur dioxide as SO <sub>2</sub> (ppm)  | Not Detected  | --  | --  | Not Detected  |
| 3       | Oxides of Nitrogen (ppm)                 | 20.28   | --  | --  | 19.26   |

| SR. NO. | TEST PARAMETERS                          | SM # 5 Natural Gas Dew Point Water Heater 00EKT01 | SM # 6 Natural Gas Dew Point Water Heater 00EKT02 | SM # 7 Natural Gas Dew Point Water Heater Unit - 40 - 40EKT01 | SM # 8 Natural Gas Dew Point Water Heater Unit - 40 - 40EKT02 |
|---------|--|---|---|---|---|
|         |  | 15/09/2023  | 15/09/2023  | 15/09/2023  | 15/09/2023  |
| 1       | Particulate Matter (mg/Nm <sup>3</sup> ) | Not Detected                                      | Not Detected                                      | Not Detected  | Not Detected  |
| 2       | Sulfur dioxide as SO <sub>2</sub> (ppm)  | Not Detected                                      | Not Detected                                      | Not Detected  | Not Detected  |
| 3       | Oxides of Nitrogen (ppm)                 | 24.19   | 22.43   | 21.24   | 19.60   |

**ANALYSIS RESULT OF PLANT STACK [SEPTEMBER 2023]**



ND\*: Below detection limit: PM: 10 mg/Nm<sup>3</sup>, Sulfur dioxide (as SO<sub>2</sub>): 0.76 ppm.

Results on 11 % O<sub>2</sub> Correction when Oxygen is greater than 11 % and 12 % CO<sub>2</sub> Correction when CO<sub>2</sub> is less than 12 %

SM#2, 3 was not in operation during monitoring.

PM for SM#1, 4, 5, 6, 7, 8 & SO<sub>2</sub> for SM#1, 4, 5, 6, 7, 8 are Below Detection Limit.



## **CHAPTER 9**

### **9.0 RESULTS OF DG STACK EMISSION MONITORING**

**MONITORING PERIOD: APRIL 2023 TO SEPTEMBER 2023**

## 9.0 D G STACKEMSSION MONITORING

### LOCATION DETAILS

| SR. NO. | MONITORING STATIONS                                    | LANDMARKS                            |
|---------|--|--------------------------------------|
| 1       | (L9 - SM 9)GPS Location: N 21°20.345' , E 72°59.300'   | Black Start Diesel Generator 00XKA01 |
| 2       | (L10 - SM 10)GPS Location: N 21°20.345' , E 72°59.301' | Black Start Diesel Generator 00XKA02 |
| 3       | (L11 - SM 11)GPS Location: N 21°20.503' , E 72°59.339' | Emergency Diesel Generator 40XKA     |

### DETAILS OF ANALYSIS METHOD:

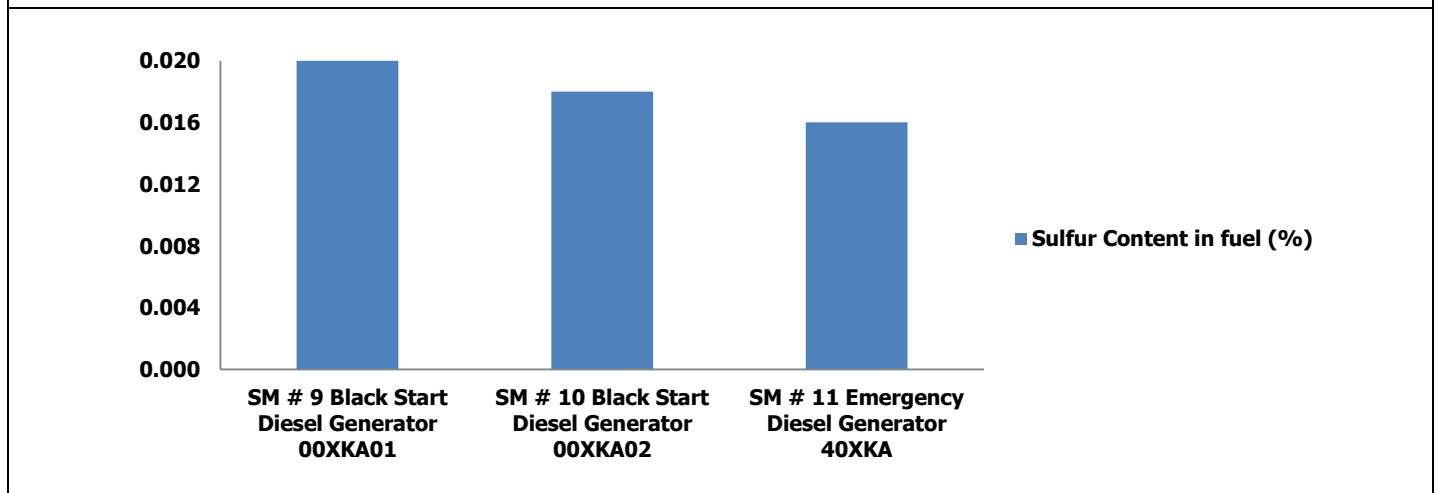
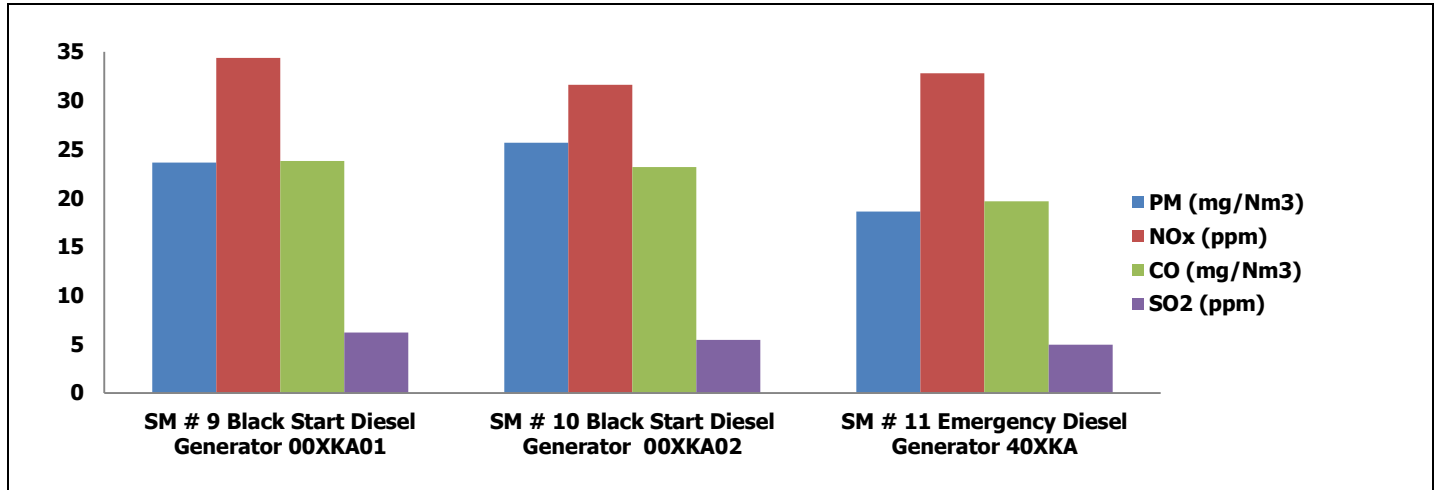
| SR. NO. | TEST PARAMETER                       | UNIT               | PERMISSIBLE LIMIT | METHOD OF MEASUREMENT  |
|---------|--------------------------------------|--------------------|-------------------|------------------------|
|         |                                      |                    | CCA/GPCB          |                        |
| 1       | Particulate Matter                   | mg/Nm <sup>3</sup> | 150               | IS:11255 (Part-1) 2014 |
| 2       | Sulfur dioxide (as SO <sub>2</sub> ) | ppm                | 100               | IS:11255 (Part-2) 2017 |
| 3       | Oxides of Nitrogen                   | ppm                | 50                | IS:11255 (Part-7) 2014 |
| 4       | Non Methyl Hydro Carbon (NMHC)       | mg/Nm <sup>3</sup> | Not Specified     | Gas Chromatography     |
| 5       | Carbon Monoxide (CO)                 | mg/Nm <sup>3</sup> | Not Specified     | Digital Gas Analyzer   |
| 6       | Sulfur Content in fuel               | %                  | Not Specified     | SOP: Sulfur Content    |



**TABLE 9.1: RESULTS OF STACK ANALYSIS [MAY 2023]**

| SR. NO. | TEST PARAMETERS                                     | SM # 9 BLACK START DIESEL GENERATOR 00XKA01 | SM # 10 BLACK START DIESEL GENERATOR 00XKA02 | SM # 11 EMERGENCY DIESEL GENERATOR 40XKA |
|---------|---|---|--|--|
|         |   | 16/05/2023                                  | 16/05/2023                                   | 15/05/2023                               |
| 1       | Particulate Matter (mg/Nm <sup>3</sup> )            | 23.64                                       | 25.66  | 18.6                                     |
| 2       | Sulfur Dioxide as SO <sub>2</sub> (ppm)             | 6.20  | 5.45   | 4.95                                     |
| 3       | Oxides of Nitrogen (ppm)                            | 34.38                                       | 31.62  | 32.80                                    |
| 4       | Non Methyl Hydro Carbon (NMHC) (mg/m <sup>3</sup> ) | Not Detected                                | Not Detected                                 | Not Detected                             |
| 5       | Carbon Monoxide (CO) mg/Nm <sup>3</sup>             | 23.79                                       | 23.16  | 19.66                                    |
| 6       | Sulfur Content in fuel (%)                          | 0.020                                       | 0.018  | 0.016                                    |

**ANALYSIS RESULT OF DG STACK [MAY 2023]**



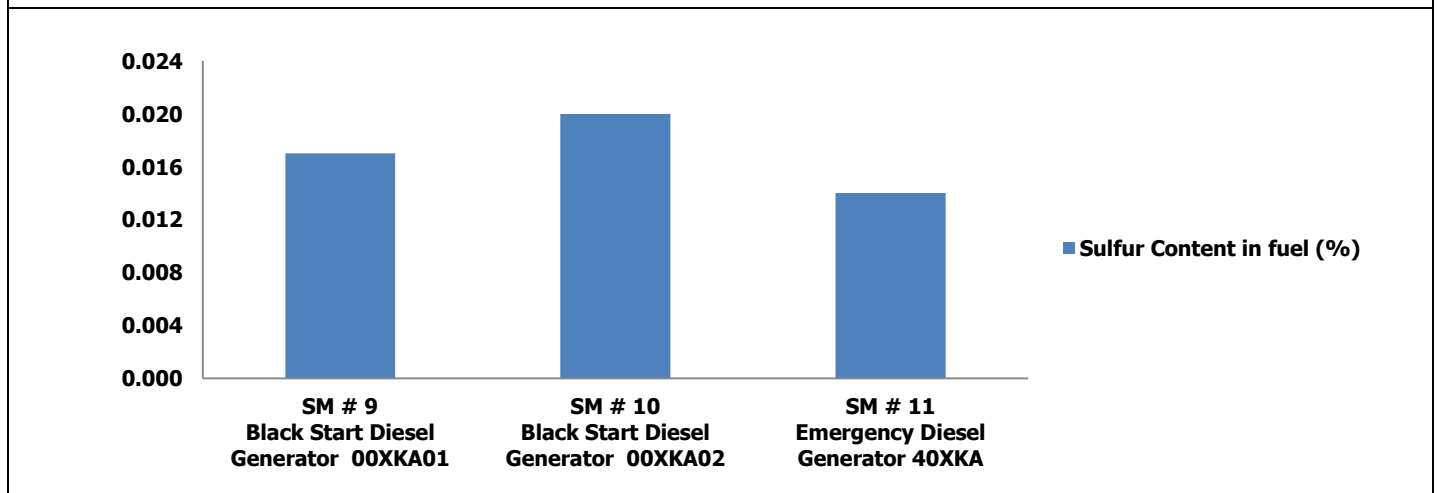
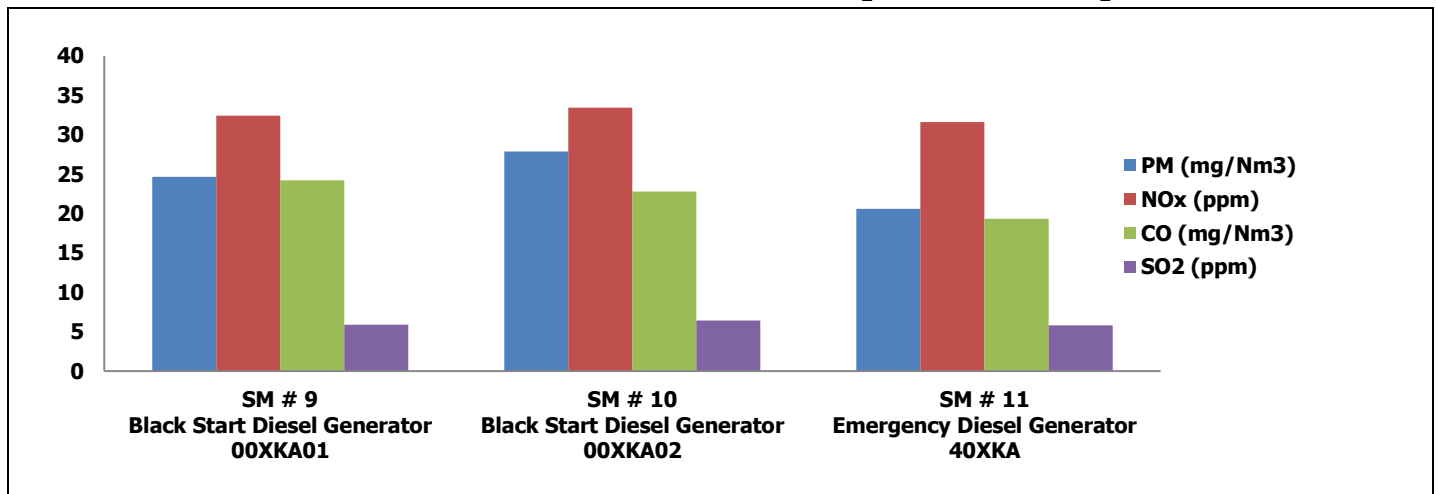
ND\*: Below detection limit, Non Methyl Hydro Carbon (NMHC): 50 mg/Nm<sup>3</sup> - Not Mentioned In Graph  
Results on 15 % O<sub>2</sub> Correction when Oxygen is greater than 15 %  
NMHC for SM#9,10,11 are Below Detection Limit.



**TABLE 9.2: RESULTS OF STACK ANALYSIS [AUGUST 2023]**

| SR. NO. | TEST PARAMETERS                                     | SM # 9 BLACK START DIESEL GENERATOR 00XKA01 | SM # 10 BLACK START DIESEL GENERATOR 00XKA02 | SM # 11 EMERGENCY DIESEL GENERATOR 40XKA |
|---------|---|---|--|--|
|         |   | 08/08/2023                                  | 08/08/2023                                   | 08/08/2023                               |
| 1       | Particulate Matter (mg/Nm <sup>3</sup> )            | 24.66                                       | 27.83  | 20.57                                    |
| 2       | Sulfur Dioxide as SO <sub>2</sub> (ppm)             | 5.89  | 6.41   | 5.81                                     |
| 3       | Oxides of Nitrogen (ppm)                            | 32.40                                       | 33.41  | 31.59                                    |
| 4       | Non Methyl Hydro Carbon (NMHC) (mg/m <sup>3</sup> ) | Not Detected                                | Not Detected                                 | Not Detected                             |
| 5       | Carbon Monoxide (CO)mg/Nm <sup>3</sup>              | 24.21                                       | 22.76  | 19.32                                    |
| 6       | Sulfur Content in fuel (%)                          | 0.017                                       | 0.020  | 0.014                                    |

**ANALYSIS RESULT OF DG STACK [AUGUST 2023]**



ND\*: Below detection limit, Non Methyl Hydro Carbon (NMHC): 50 mg/Nm<sup>3</sup> - Not Mentioned In Graph  
Results on 15 % O<sub>2</sub> Correction when Oxygen is greater than 15 %  
NMHC for SM#9, 10 are Below Detection Limit.



# **CHAPTER 10**

## **10.0 OBSERVATION**



## **OBSERVATIONS**

**The Environmental Monitoring including Stack (Plant main stacks & DG stacks) ambient air, Ground water, Treated Effluent Water, Sewage Water, Soil and Noise in and around the Torrent power, SUGEN site was carried out during APRIL 2023 TO SEPTEMBER 2023; all parameters of collected samples were within the statutory requirements.**

### **1. EMISSION QUALITY FROM STATIONARY SOURCES**

Emission monitoring of stationary sources was conducted for plant stacks and Diesel generator stacks. The frequency of monitoring of Plant stack (including Heat recovery & Gas turbine stack, Natural gas dew point water heater stack) was once in a month, while Diesel generator stack was monitored twice in six month.

In Plant stack, parameter PM, SO<sub>2</sub> & NO<sub>x</sub> were monitored and in diesel generator stack, parameter PM, SO<sub>2</sub> & NO<sub>x</sub>, Non methyl hydro carbon (NMHC), Carbon Monoxide (CO) & Sulfur Content were monitored.

#### ***Plant stack:***

Particulate matter and SO<sub>2</sub> observed below detection limit & NO<sub>x</sub> observed in the range of 17.72 – 24.19 ppm during above period.

#### ***Diesel generator stack:***

Particulate matter observed in the range of 18.60 – 27.83 mg/Nm<sup>3</sup>, SO<sub>2</sub> observed in the range of 4.95 – 6.41 ppm, NO<sub>x</sub> observed in the range of 31.59 – 34.38 ppm, CO observed in the range of 19.32 – 24.21 mg/Nm<sup>3</sup>, Sulfur content found in the range of 0.014 – 0.020 %. Non methyl hydro carbon (NMHC) observed below detection limit.

### **2. AIR QUALITY**

Ambient Air quality monitoring was carried out once in a Month at six locations covering Sukan Building, Switch Yard, Shardashish colony, Surabhi, Akhakhol Village, Navi Pardi Village.

The various parameters were monitored including PM<sub>2.5</sub>, PM<sub>10</sub>, Sulphur dioxide, Oxides of nitrogen, Ammonia, Benzo(a) Pyrene, Benzene, Carbon monoxide, Ozone and Arsenic, Nickel & Lead.

PM<sub>10</sub> & PM<sub>2.5</sub> were varied in the range of 40.36 - 74.38 µg/m<sup>3</sup> and 15.25 - 40.44 µg/m<sup>3</sup> respectively. SO<sub>2</sub> & NO<sub>x</sub> were varied in the range of 6.28 - 20.23 µg/m<sup>3</sup> and 12.32 - 33.66 µg/m<sup>3</sup> respectively and other air bone pollutants including Benzo (a) Pyrene, Nickel, Mercury & Arsenic in particulate phase were found below detection limit. Also Gaseous pollutants such as Carbon monoxide was varied in range 0.18 - 0.66 mg/m<sup>3</sup>, Ozone 10.55 – 26.31 µg/m<sup>3</sup>, Ammonia 10.24 – 25.37 µg/m<sup>3</sup>.

All parameters were observed in acceptable range as per National Ambient Air Quality Standards, CPCB New Delhi.

### 3. NOISE LEVEL:

The noise level monitoring was carried out once in a month including day and night at 14 locations. At all the locations day time noise level was varied in the range of 42.4 – 66.3 dB (A) and Night time noise level was varied in the range of 39.7 – 55.4 dB (A) during night time, which are found well within the specified limits 75 dB (A) for day time & 70 dB (A) for Night time.

### 4. GROUND WATER:

The ground water monitoring was carried out at two locations at frequency once in a month. The results were compared with the drinking water quality standards specified in IS: 10500 & it was observed that all parameters were in acceptable/permissible range. Hence it is appeared no noticeable changes in ground water quality of sampling site due to activity of power plant.

### 5. SOIL:

Soil quality was assessed through sampling and analysis once in three months at six locations for various parameters including Bulk Density, Organic Matter, Water Holding Capacity, pH (20% slurry), Soil Texture, Bicarbonates, Chlorides, Conductivity, Potassium, Phosphorus and Nitrogen. All parameters were observed in acceptable range as per Hazardous waste rules, 2016.

### 6. TREATED EFFLUENT WATER & SEWAGE WATER:

The treated effluent water monitoring carried out once in a month for parameter - pH, Temperature, Colour, Oil & Grease, Suspended Solid, Phenolic Compound, Sulphide, Total Dissolved Solids, BOD (3 day), COD, Hexavalent Chromium, Total Chromium, Total Copper (As Cu), Total Zinc, Total Iron (As Fe), Ammonical Nitrogen, Chloride, Sulphate, Phosphate, Bio Assay and TOC Test. From among the tested parameters, oil & grease, Phenolic compound, Hexavalent Chromium, Total Chromium, Total Copper (As Cu) and Total Zinc were found below detection limit in all collected sample. Result of treated effluent water parameter observed well within permissible limit.

The sewage water monitoring carried out once in a month at two locations for parameter - BOD (3 Days @ 27°C), Suspended Solids, Residual free Chlorine. Result of Sewage water parameter observed well within permissible limit.

**OBSERVATION OF AMBIENT RESULT**

| Parameter   | Location | SUKAN BUILDING | SWITCH YARD | SURBHI (INTEK WELL) | SHARDASH ISH COLONY | AKHAKHOL | NAVI PARDI | OVER ALL RESULT |
|---|----------|----------------|-------------|---------------------|---------------------|----------|------------|-----------------|
| <b>PM<sub>10</sub></b><br>( $\mu\text{g}/\text{m}^3$ )  | Maximum  | 53.62          | 60.22       | 68.17               | 60.53               | 67.54    | 74.38      | 74.38           |
|   | Minimum  | 40.36          | 45.34       | 55.34               | 45.34               | 49.54    | 65.34      | 40.36           |
|   | Average  | 44.83          | 53.01       | 60.98               | 51.09               | 59.79    | 70.44      | 56.69           |
| <b>PM<sub>2.5</sub></b><br>( $\mu\text{g}/\text{m}^3$ ) | Maximum  | 22.65          | 26.41       | 30.21               | 27.63               | 30.45    | 40.44      | 40.44           |
|   | Minimum  | 15.25          | 21.50       | 26.32               | 17.61               | 22.47    | 33.41      | 15.25           |
|   | Average  | 18.13          | 24.47       | 27.72               | 21.04               | 27.16    | 35.61      | 25.69           |
| <b>SO<sub>2</sub></b><br>( $\mu\text{g}/\text{m}^3$ )   | Maximum  | 9.49           | 12.65       | 18.27               | 12.63               | 14.50    | 20.23      | 20.23           |
|   | Minimum  | 6.28           | 7.53        | 8.63                | 9.49                | 11.41    | 15.33      | 6.28            |
|   | Average  | 8.03           | 9.82        | 14.32               | 10.59               | 12.83    | 17.53      | 12.19           |
| <b>NO<sub>x</sub></b><br>( $\mu\text{g}/\text{m}^3$ )   | Maximum  | 19.42          | 24.28       | 28.59               | 21.61               | 25.38    | 33.66      | 33.66           |
|   | Minimum  | 12.32          | 19.28       | 22.46               | 16.37               | 19.33    | 26.42      | 12.32           |
|   | Average  | 15.17          | 21.29       | 24.36               | 18.20               | 21.87    | 30.68      | 21.93           |
| <b>NH<sub>3</sub></b><br>( $\mu\text{g}/\text{m}^3$ )   | Maximum  | 15.68          | 18.52       | 19.23               | 13.62               | 20.43    | 25.37      | 25.37           |
|   | Minimum  | 11.45          | 13.54       | 10.32               | 10.24               | 14.34    | 19.46      | 10.24           |
|   | Average  | 13.67          | 15.95       | 15.47               | 11.78               | 17.06    | 21.73      | 15.94           |
| <b>O<sub>3</sub></b><br>( $\mu\text{g}/\text{m}^3$ )    | Maximum  | 17.64          | 23.46       | 22.62               | 20.62               | 20.33    | 26.31      | 26.31           |
|   | Minimum  | 10.55          | 16.51       | 15.42               | 14.71               | 13.29    | 20.49      | 10.55           |
|   | Average  | 14.42          | 20.22       | 19.30               | 17.88               | 17.26    | 23.89      | 18.83           |
| <b>CO</b><br>( $\text{mg}/\text{m}^3$ )                 | Maximum  | 0.38           | 0.30        | 0.34                | 0.52                | 0.48     | 0.66       | 0.66            |
|   | Minimum  | 0.21           | 0.18        | 0.23                | 0.27                | 0.30     | 0.40       | 0.18            |
|   | Average  | 0.31           | 0.25        | 0.29                | 0.41                | 0.39     | 0.49       | 0.36            |

**Remark:** Other parameters such as Lead, Arsenic, Benzo (a) Pyrene, Nickel and Benzene are almost Below Detection Limit.

**OBSERVATION OF NOISE RESULT IN dB (A) [APRIL 2023 TO SEPTEMBER 2023]**

| NOISE Location  | Day Time |      |      | Night Time |      |      |
|---|----------|------|------|------------|------|------|
|   | Avg.     | Max  | Min  | Avg.       | Max  | Min  |
| <b>N1 # Boundary Wall at Back Side of GSPL Gas Station</b>    | 50.5     | 55.3 | 46.8 | 45.2       | 51.3 | 40.3 |
| <b>N2 # Boundary Wall at Back Side Maintenance Lay Down</b>   | 56.1     | 60.1 | 50.8 | 47.4       | 50.3 | 45.4 |
| <b>N3 # Boundary Wall at Backside of Fire Water Reservoir</b> | 59.6     | 66.3 | 52.4 | 46.3       | 49.7 | 42.2 |
| <b>N4 # Nr. Sukan : AAQM Station</b>                          | 48.8     | 55.2 | 44.8 | 42.9       | 45.9 | 41.2 |
| <b>N5 # Boundary Wall at Barrier Gate : 2 - Tejpath</b>       | 48.7     | 56.4 | 45.3 | 45.5       | 50.5 | 41.9 |
| <b>N6 # Boundary Wall at Banyan Tree Gate to Satkar</b>       | 49.7     | 58.9 | 45.9 | 44.3       | 47.4 | 42.2 |
| <b>N7 # Shardashish : Nr. Ashok Circle –Pond Gate</b>         | 51.7     | 53.7 | 48.2 | 42.7       | 43.6 | 41.7 |
| <b>N8 # Shardashish : Akhakhhol Gate</b>                      | 48.0     | 54.3 | 44.8 | 41.4       | 42.6 | 39.7 |
| <b>N9 # Near Swagat Gate</b>                                  | 47.4     | 52.4 | 42.4 | 43.1       | 46.7 | 40.9 |
| <b>N10 # Surbhi</b>   | 50.6     | 53.6 | 48.4 | 43.8       | 45.5 | 41.8 |
| <b>N11 # Akhakhhol Village</b>                                | 52.0     | 53.9 | 50.6 | 43.2       | 44.2 | 41.8 |
| <b>N12 # Navipardi Village</b>                                | 53.1     | 53.8 | 52.7 | 43.2       | 44.6 | 41.5 |
| <b>N13 # Entry Gate - East Side</b>                           | 56.6     | 61.7 | 48.2 | 50.4       | 55.4 | 42.1 |
| <b>N14 # Tejpath Turn – West Side of Sanman Circle</b>        | 48.6     | 50.4 | 46.8 | 45.1       | 46.3 | 43.7 |
| <b>Overall Results</b>  | 51.5     | 66.3 | 42.4 | 44.6       | 55.4 | 39.7 |