Birpara College, College Para, Birpara Tea Garden, Birpara, West Bengal - 735204

GREEN AUDIT REPORT 2023-2024

Audited By :

Dr. Indranil Ghosh

Lead Auditor
Environmental Management System (ISO 14001:2015)
IRCA - CQI Registered

ISO 14001:2015

Certificate of Registration

This is to Certify That
Environmental Management System of

BIRPARA COLLEGE

COLLEGE PARA, BIRPARA TEA GARDEN, BIRPARA - 735204,
WEST BENGAL, INDIA.

has been assessed and found to conform to the requirements of

ISO 14001:2015

for the following scope :

PROVIDING TEACHING TO THE UNDER GRADUATE DEGREE PROGRAM IN BA (BENGALI, NEPALI, ENGLISH, HISTORY, SOCIOLOGY, POLITICAL SCIENCE AND GEOGRAPHY), B.SC (PHYSICS, COMPUTER SCIENCE AND MATHEMATICS) AND B. COM (ACCOUNTANCY).

Certificate No	: **24MEETA19**		
Initial Registration Date	: 16/12/2024	Issuance Date	: 16/12/2024
Date of Expiry	: 15/12/2027		
1st Surve. Due	: 16/11/2025	2nd Surve. Due	: 16/11/2026

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GA/BC/2023-24/02

GREEN AUDIT, ENVIRONMENT & ENERGY AUDIT CERTIFICATE

Is awarded for 2023-2024 to the Esteemed Institution
BIRPARA COLLEGE,
College Para, Birpara Tea Garden, Birpara, West Bengal - 735204.

This is to certify that BIRPARA COLLEGE, Birpara, West Bengal , has conducted detailed Environmental Green Audit including Energy Audit for 2023-24 for their campus and submitted necessary data and credentials for scrutiny. The activity and measure carried out by the college was found satisfactory. The efforts taken by the students, faculty members and the college authority towards Environment and Sustainability is highly appreciated and commendable.

Issued on 15th November, 2024 and valid till 14th November, 2025

Dr. Indranil Ghosh
Lead Auditor, Environmental Management System (ISO 14001:2015)
IRCA - CQI Registered &
Associate Professor in Environmental Science

Executive Summary

In accordance with the Environmental policy of the Birpara College, the Green Audit, 2023-24 of the college was conducted in December, 2024.

The purpose of the audit was to ensure that the practices followed in the campus are in accordance with the standard Green Policy adopted by different academic institutions and the college itself. With this in mind, the specific objectives of the audit were to evaluate the adequacy of the management control framework of Environment Sustainability as well as the degree to which the College is in compliance with the applicable regulations, policies and standards.

During the initial planning of the audit, an analysis was conducted in order to identify, predict, evaluateand prioritize the parameters associated with the environmental sustainability. The analysis was based upon an examination of the policies, manuals and standards that govern the environmental sustainability, on data analysis, and on the results of preliminary interviews with personnel considered key in the Environmental Management System (EMS) in the campus. The criteria and methods used in the audit were based on the identified impacts. The methodology used included physical inspection of the campus, review of the relevant documentation and interviews.

Acknowledgement

We would like to thank to Kaustav Chakraborty, the Principal of Birpara College, Birpara, West Bengal for his consent to conduct this audit. I would like to sincerely thank all the Departments, students, teaching and non-teaching staff for their kind cooperation with us during this survey.
We would also like to express our special thanks to Mr Ranjit Roy, Assistant Professor in Bengali and Mr Pranoy Dey, Assistant Professor in Geography, Dr. Arnab Chakraborty, Associate Professor in Bengali, Prof Dipankar Bhowmik, Associate Professor in Commerce, Dr. Jyotirmay Roy, Assistant Professor and Mr. Indrajit Paul, Head Clerk & Accountant for their dedicated and sincere effort to make the report complete.

Assurance

This audit has been conducted in accordance with the *International Standards for the Professional Practice of Auditing*.

In our professional judgment, sufficient and appropriate audit procedures were completed and evidence gathered to support the accuracy of the conclusions reached and contained in this report. The conclusions are based on a comparison of the situations as they existed at the time of the audit with the established criteria.

1.0 Introduction

Global warming and climate change pose significant threats to our planet and demand immediate attention and action. The consequences of these phenomena are far-reaching, with rising temperatures, erratic rainfall patterns, and more frequent extreme weather events wreaking havoc on ecosystems, wildlife, and human livelihoods. The impact of climate change is not limited to environmental concerns alone; it also exacerbates vulnerabilities and inequalities, hitting marginalized communities the hardest. Displacement and conflicts arise as people are forced to migrate due to the adverse effects of climate change, further destabilizing societies. Additionally, climate change is linked to the spread of diseases, as altered weather patterns create favourable conditions for disease vectors and infectious agents to thrive, exemplified by the COVID-19 pandemic. Urgent action is imperative to mitigate the catastrophic consequences of climate change. This includes reducing greenhouse gas emissions, transitioning to renewable energy sources, enhancing resilience to climate impacts, and adopting sustainable practices across various sectors. In the fight against climate change, industries and other institutions can play a pivotal role by incorporating green auditing into their operations. **Considering its importance, the National Assessment and Accreditation Council (NAAC) made a rule that all higher education institutions in India must do a green audit. This is important because NAAC gives a grade to institutions that shows how good is their education, facilities, research etc. Now, with the green audit, it also reflects how well they're taking care of the environment.**

Green Audit can be defined as it is a systematic, documented, periodic and objective review by regulated entities of facility operations and practices related to meeting the environmental requirements. The 'Green Audit' aims to analyze environmental practices within and outside the college campus, which will have an impact on the eco-friendly ambience. It was initiated with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment as whole. Through Green Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out Green Audit.

Green audits within educational institutions play a dual role. On one hand, they meticulously examine and evaluate the ecological impact of the institution's operational endeavours, thereby promoting the adoption of sustainable practices. This includes scrutinizing resource consumption, waste management, and energy efficiency, among other factors. On the other hand, green audits impart a profound educational experience upon students, instilling within them a sense of

environmental responsibility. As students witness their campus embracing environmentally conscious measures, they are encouraged to incorporate similar principles into their own lifestyles. Furthermore, the impact of green audits extends beyond immediate tangible results. These audits contribute to the creation of "green campuses," where the physical environment is consciously moulded to align with sustainable principles. Such campuses exemplify a holistic commitment to environmental welfare, often characterized by energy-efficient buildings, green spaces, waste reduction initiatives, and sustainable transportation options.

The concept of green institutions should not be confined only within the Institution and should be extended to the surrounding areas. In this way, various "in reach" programs or internal-focused initiatives and outreach programs can be conducted as part of spreading the concept of green institutions to rural, tribal and urban communities. Such programs are for activities focused on green enterprise development and environmental protection. Academic research projects, dissertations and thesis can be linked to such activities as part of promoting the concept of green colleges for educational institutions and such a trend should be encouraged among students and staff members. Such outreach programs can be implemented in a more efficient manner by integrating them with existing government schemes related to biodiversity conservation. Public skepticism about government schemes related to biodiversity conservation activities is prevalent, especially in rural areas. Hence, government schemes aimed at reaching rural areas to provide clean and safe water, along with initiatives for the conservation of biodiversity and education about the importance of sanitation, will help to inculcate a sense of environmental responsibility among stakeholders and build such a society. There is a relationship between Green Audit and Sustainable Development of any organization. The primary needs for achieving the sustainable development of any organization are to determine the Green Audit policy, Green Audit Framework, Accurate implementation, and Result analysis of it. Strong Green Audit process can help to achieve the sustainability. Green Audit framework helps to achieve the goal set by an organization. Green Audit is linked to Sustainable development process. Green Audit and sustainable development process help to reduce the wastage and associated cost as well as increases the product quality.

A View of Birpara

Birpara on the Map

Location of Birpara

1.1 About the College

Birpara College is a West Bengal Government Aided, General Degree College affiliated to North Bengal University and recognized by UGC Under Section 2(f) and 12 (B). **The College** is a prominent undergraduate educational institution situated in **Birpara**, a small town in the **Alipurduar district** of **West Bengal**, India. Established in **1986**, it caters to the academic needs of students from Birpara and surrounding regions, providing them with opportunities to pursue higher education in arts,science and commerce disciplines.

Birpara College is located in **Birpara**, a town situated near the foothills of the **Himalayas**, close to the **Bhutan border**. The town is known for its scenic beauty, surrounded by lush green tea gardens and hills. The college's location offers students a serene and peaceful environment conducive to learning, away from the hustle and bustle of urban life.

Birpara College plays an important role in the local community by providing accessible higher education to students from rural and semi-urban backgrounds. Many students come from families involved in farming or tea estates. The college helps bridge the educational gap by offering affordable and quality education.

Birpara College offers a peaceful and supportive learning environment for students, especially those in rural and semi-urban areas, to pursue higher education. With its wide array of courses, dedicated faculty, and various extracurricular activities, the college strives to provide a holistic education to its students. The combination of academic rigor, cultural engagement, and social responsibility makes Birpara College an important educational institution in the region.

The college is located on a beautiful campus of 7.05 Acre. The campus is located 65.6 km away from the Alipurduar, the district head quater. The nearest Railway Dalgaon is within 1 km and Bagdogra airport is 118 KM away from here respectively. The campus is surrounded by greenery and beautiful Landscape. There is also a glimpse of Kanchenjunga, the third highest mountain in the world. The allure of the mighty Himalayas, the pristine beauty of the Dooars, the dense virgin vegetation, the enchanting valleys and meadows and of course the perennially bright but cool weather have put this place on the map of the most important tourist destinations in the Eastern Himalayas. The main road is around 150 meters away from the college buildings. There are four buildings in the campus and each building has two floors. The total built up area is 5229 Sq. Meter. One Tea estate is located in the 5 km radius of the college campus.

The college has only one shift and starts from 10:45 am and closes at 4:45 pm. Total 2545

students are studying in three different under graduate programs viz BA, BSc and B Com.

The college is desirous to adopt the "Green Campus" system for environmental conservation and sustainability. There are three main pillars i.e.

- Zero environmental foot print
- Positive impact on occupational health performance
- 100% graduates demonstrating environmental literacy.

The goal is to reduce CO_2 emission, energy and water use, while creating an atmosphere where students can learn and be healthy. The college administration works on the several factors of "Green Campus" including Water Conservation, Tree Plantation, Waste Management, Paperless Work, Alternative Energy and Mapping of Biodiversity.

Birpara College

1.2 Objectives of the Study

Green auditing in educational institutions serves as a pivotal tool for fostering sustainable practices, environmental responsibility, and holistic resource management. The main objective of the green audit is to promote the Environment Management and conservation in the College Campus. The purpose of the audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards. The main objectives of carrying out Green Audit are:

1. Verifying compliance: Verifying compliance with standards or best available techniques.
2. Identifying problems: Detecting any leakage, spills or other such problems with the operations and processes.
3. Formulating environmental policy: Formulating the organization's environmental policy if there is no existing policy.
4. Measuring environmental impact: Measuring the environmental impact of each and every process and operation on the air, water, soil, worker health and safety and society at large.
5. Measuring performance: Measuring the environmental performance of an organization against best practices.
6. Confirming environmental management system effectiveness: Giving an indication of the effectiveness of the system and suggestions for improvement.
7. Providing a database: Providing a database for corrective action and future plans.
8. Developing the organization's environmental strategy: Enabling management to develop its environmental strategy for moving towards a greener corporate and performance culture.
9. Communication: Communicating its environmental performance to its stakeholder's through reporting which will enhance the image of the organization.

1.3 General steps of Audit

- **Comprehensive Evaluation:** Conduct a thorough assessment of the institution's environmental performance, covering resource usage, waste management, emissions, and compliance with environmental regulations.
- **Systematic Approach:** Follow a structured and systematic process, including planning, data

collection, analysis, risk identification, and development of improvement strategies.

- **Data-Driven Objectives:** Adopt standardized criteria for green auditing objectives, tailored to the institution's goals and regulatory requirements, while addressing data challenges related to access, quality, and accuracy.
- **Compliance and Adherence:** Assess the institution's compliance with environmental regulations and its commitment to sustainable practices, ensuring adherence to legal frameworks and responsible environmental practices.
- **Objectivity and Independence:** Prefer external environmental audits conducted by independent teams with specialized skills, ensuring objectivity in the assessment of environmental performance.
- **Long-Term Sustainability:** Recognize that green auditing is a long-term process aim achieving sustainable environmental change and improvement, acknowledging that significant changes may take time to implement effectively.
- **Documentation and Verification:** Rely on supporting documents and verifiable information to ensure compliance with environmental requirements and regulatory standards.
- **Integration with Management Systems:** Integrate green auditing into the institution's management systems, incorporating it as a vital tool for assessing, evaluating, and managing environmental performance within the educational framework.
- **Goal-Oriented:** Align the institution's environmental performance with its environmental policy, goals, and objectives, ensuring compliance with relevant standards and regulatory requirements.
- **Environmental Education and Engagement:** Disseminate environmental information among students and staff, conduct training and awareness programs, and foster engagement through green practices, competitions, and awards.
- **Continuous Improvement Strategies:** Evaluate current practices, identify necessary adjustments, and develop targeted strategies for promoting sustainability within the institution, spanning areas such as resource consumption, energy efficiency, and waste reduction.

By embracing these objectives and elements, green auditing in educational institutions not only supports environmental conservation but also nurtures a culture of sustainability, knowledge dissemination, and responsible resource management among students, staff, and faculty.

1.4 The audit process

1.4.1 Pre-audit activities

The pre-audit activities include the following:

1. The sites / area /division that are to be audited need to be determined and selected.
2. The Audit Team was informed on the date of the audit which enabled them to adjust and become used to the concept.
3. The audit scopes were identified. Audit Team was consulted when establishing the scope.
4. The audit plan was designed in such a way that it accommodated changes based on information gathered during the audit and effective use of resources.
5. Audit team and assignment of responsibility were established.
6. The required working papers were collected. This facilitated the investigations of audit team on the sites.
7. The background information on the facility including the facility organization, layout and processes, and the relevant regulations and standards, were collected.
8. The background information on the site's historical uses, and the location of soil and ground water contamination were collected.
9. The pre-audit questionnaire was informed to auditee.

1.4.2 Onsite audit activities

The onsite audit includes:

1. The opening meeting is the first step between the audit team and college authority. In this meeting the purpose of audit, the procedure and the time schedule were discussed.
2. Site inspection is the second step for onsite activity. In this step the audit team discovered matters which are important to the audit but which were not identified at the planning stage.
3. On site phase of the audit developed a working understanding of how the facility manages the activities that influence the environment and how any EMS, if there is one, works.
4. Assessed strengths and weaknesses, controls and risks associated with their failure were established.
5. Gathering audit evidence i.e, collecting data and information using audit protocol.
6. Communicated with the Audit Team to obtain most information.
7. Evaluated the audit evidence against the objectives established for the audit.
8. An exit meeting to explain the audit findings.

1.4.3 Post Audit Activities

1. Issue draft report
    - Correct closing report
    - Determine distribution list
    - Distribute draft report
    - Allow time for corrections

2. Issue final report
    - Correct draft report
    - Distribute final report
    - Highlight requirement for action plan
    - Determine action plan preparation deadline
    - Action plan preparation and implementation
    - Based on audit findings in final report

3. Follow-up on action plan

1.5 Methodology

In order to perform green audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered the following areas to summarize the present status of environment management in the campus:

- Water management
- Energy Conservation
- Waste management
- E-waste management
- Green area management
- Green Practices

2.0 Water Management system Audit

A water audit is a comprehensive assessment of water consumption, usage patterns, and potential inefficiencies within a given system or facility. In the context of educational institutions, conducting a water audit is a crucial step towards promoting water conservation, reducing operational costs, and fostering environmental sustainability. Educational institutions, being centers of learning and influence, have a responsibility to set an example in resource management. A water audit serves as a tool to understand and optimize water usage, thereby contributing to overall sustainability goals.

A water audit is an on-site survey and assessment of water-using hardware, fixtures, equipment, landscaping, and management practices to determine the efficiency of water use and to develop recommendations for improving water-use efficiency (Newcomb, 2008). In simple words, a water audit is a systematic review of a site that identifies the quantities and characteristics of all the water uses. The site may vary from a public water utility, facility (institutional or commercial properties like malls, office, schools etc.) or a household. The overall objective of conducting a water audit is to identify opportunities to make system or building water use more efficient. Since water uses vary greatly from one type of business or institution to another and from site to site, therefore water audit is crucial to determine quantity, nature and quality of water consumption. Water audit for a water utility refers to tracking, assessing and validating all components of flow from the site of withdrawal or treatment through the water distribution system and into the consumer's properties. On the other hand, water audit of an office building would review direction and quantity of water used for domestic, cooling/heating, sanitary and landscaping processes. Whereas, a domestic water use audit examines the major areas in which a facility uses water, including human consumption, personal hygiene & sanitation, washing, cleaning, laundry, gardening etc.

2.1 Purpose of a Water Audit

The primary objectives of conducting a water audit in educational institutions are as follows:

- **Resource Efficiency:** Educational institutions often have a substantial water footprint due to numerous buildings, amenities, and large student populations. A water audit helps identify areas where water is being used inefficiently or excessively, allowing for targeted improvements.

- **Cost Reduction:** By identifying leaks, wasteful practices, and inefficient systems, educational

institutions can reduce water consumption, leading to significant cost savings in utility bills.

- **Environmental Sustainability:** Efficient water management contributes to the institution's environmental goals by reducing the strain on local water resources, promoting responsible water usage, and decreasing the institution's overall ecological impact.

- **Benefits and Outcomes:** The benefits of conducting a water audit in educational institutions are numerous:

- **Water Conservation:** Reduced water consumption leads to preservation of local water resources and a reduced ecological footprint.

- **Financial Savings:** Lower water consumption results in reduced utility bills, freeing up resources for other essential activities.

- **Educational Value:** The audit process itself can raise awareness about water conservation among students, staff, and faculty, promoting a culture of sustainability.

- **Public Image:** Demonstrating commitment to environmental responsibility enhances the institution's reputation and attractiveness to environmentally conscious students and stakeholders.

- **Regulatory Compliance:** Complying with local and national water regulations and guidelines is essential for avoiding penalties and legal issues.

2.2 Water Use

This indicator addresses water consumption, water sources, irrigation, storm water, appliances and fixtures. A water audit is an on-site survey and assessment to determine the water use and hence improving the efficiency of its use.

The water usage can be referred to as water used for various activities like usage in the canteen, academic blocks, gardens etc. The water usage in the campus includes both drinking purpose and non-drinking purposes. The non-drinking purposes include toilet, gardening, cleaning etc. The campus has an administrative office, academic blocks, conference and cultural infrastructure and canteen.

2.3 Observations

The study observed that underground water is the only source of supply of water. Water is used for drinking purpose, toilets, laboratory and gardening. During the survey, no loss of water is observed, neither by any leakages nor by over flow of water from overhead tanks. However, during Monsoon season very less amount of overflow takes place through drains. The data collected from all the departments is examined and verified. On an average the total use of water in the college is 8000 L/day during the monsoon and 6000L/day during post monsoon, which include domestic purposes, gardening and for different laboratories.

The work on rain water harvesting is under process. During monsoon water consume in toilet 5000 LPD, Garden 2000 LPD and in canteen 1000 LPD.

2.4 Recommendations

- Need of monitoring, controlling overflow is essential and periodically supervision drills should be arranged. In campus small scale/medium scale/large scale reuse and recycle of water system is necessary.
- Minimize wastage of water and use of electricity during water filtration process, if used.

- Ensure that all cleaning products used by college staff have a minimal detrimental impact on the environment, i.e. are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations.

2.5 Audit Framework and detailed findings: Water management

Control objective	Control(s)	Audit Observation	Conformity
Minimize consumption of water.	Repair sources of water leakage, such as dripping taps and showers as quickly as possible.	Regular checking and maintenance of pipelines are done to control water wastage.	YES
	Install appliances which reduce water consumption	Practiced as much as possible.	YES
	Encourage a decrease in water usage among staff, students and conference guests	College does encourage a decrease in water usage among staff, students and conference guests. The water consumption is minimal.	YES
	Purchase the most efficient washing machines and dishwashers available which have an economy setting as default.	These are not required by the college.	NA
	Use an efficient and hygienic water storage mechanism to minimize the loss of water during storage	The college cleans the reservoirs in regular intervals (twice a year).	YES
	Minimize wastage of water and use of electricity during water filtration process, if used, such as RO filtration process and ensure that the equipment's used for such usage, are regularly serviced, and the wastage of water is not below the industry average for such equipment's used in similar capacity	The college uses RO to filtrate the water.	YES
	Install Water recycling mechanism, such as rain water harvesting system	The college has Rain water Storage system.	YES

Source of Purified drinking water

3.0 Energy Management System Audit

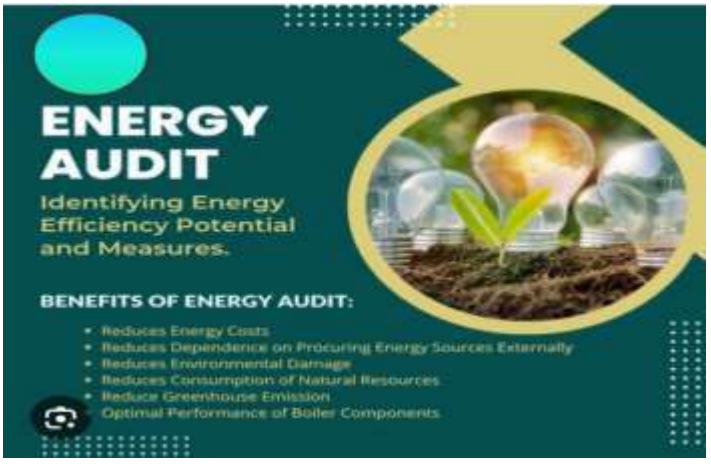
An energy management system audit comprises a detailed analysis of the energy performance of an organization, equipment, system(s) or process(es). It is based on appropriate measurement and observation of energy use, energy efficiency and consumption. Energy audits are planned and conducted as part of the identification and prioritization of opportunities to improve energy performance, reduce energy waste and obtain related environmental benefits. Audit outputs include information on current use and performance and they provide ranked recommendations for improvement in terms of energy performance and financial benefits (ISO 50002:2014). It deals with the energy conservation and methods to reduce the consumption and the related pollution.

3.1 Energy Conservation

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliance, natural gas and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

3.2 Observations

Total energy consumption is determined as 9924 KWH/Year by major energy consuming equipment. All the departments and common facility centers are equipped with LED. Approximately 324 LED bulbs are counted during survey. The college has four (04) Air conditioning machines. Besides this, photovoltaic cells are also installed in the campus as an alternate renewable source of energy. Six Solar panel light are installed in the campus. Equipment like Computers (120 nos. with TFT monitors) and printers (20) are used with power saving mode. The college conducts the switch off drills at regular intervals. In laboratories like Computer and Geography, the switch is shut down after occupancy time and is one of the green practices for energy conservation. Total 25 CCTV have been installed in the entire campus. Two water pumps are in use to lift the water from the underground reservoir to the overhead tanks.



- **Monthly Energy Consumption by Appliances in the Institution**

Appliances	No.of Appliances	Units of Current
Computers and printers	140	7000
Air conditioners	04	00
CFL bulbs	00	00
Photocopiers	02	2000
LED lights	324	2916
Incandescent bulbs	00	00
Fans	112	00
Tubelights	00	00
Electrical Equipment	0	0
Inverters	0	0
Heaters	00	00
CCTV DVR	25	125
Water pumps	2	2250
Refrigerators	1	300
Other appliances	10	900
Total actual average Energy usage per month (KWh)		**827***

- Considering all appliances are running for 6hrs per working day in a month. ACs use only in very high temperature. During the vacations, all the appliances were switched off
- Rest of the required energy (electricity) was consumed from the photo voltaic cells installed in the campus.

3.3 Recommendations

- Support renewable and carbon-neutral electricity options on any energy-purchasing consortium, with the aim of supplying all college properties with electricity that can be attributed to renewable and carbon-neutral sources.
- Appreciate that it is preferable to purchase electricity from a company that invests in new sources of renewable and carbon-neutral electricity.
- Installation of more LED lamps instead of CFL.

3.4 Audit Framework and detailed findings: Energy Management

Control objective	Control(s)	Audit Observation	Conformity
Reduce energy consumption, especially of energy derived from fossil fuels	Support renewable and carbon-neutral electricity options on any energy-purchasing consortium, with the aim of supplying all college properties with electricity that can be attributed to renewable and carbon-neutral sources.	No, the college does not have any choice of renewable and carbon-neutral electricity options on any energy-purchasing consortium, with the aim of supplying all college properties with electricity that can be attributed to renewable and carbon-neutral sources.	NO
	Appreciate that it is preferable to purchase electricity from a company that invests in new sources of renewable and carbon-neutral electricity	The College has no choice other than *WEST BENGAL STATE ELECTRICITY ISTRIBUTION COMPANY LIMITED*. The company is a PSU of govt of West Bengal. The company which invests Roof top Solar PV systems. .	YES
	Look in to the possibility of on-site micro-generation of renewable electricity.	The College has solar panel street light renewable electricity.	YES
	Give preference to the most energy efficient and environmentally sound appliances available, this includes only using energy-saving light bulbs.	The College is using LED as much as practicable.	YES
	Provide energy efficient heating systems, with adjustable controls for individual heating appliances wherever possible, and ensure that comprehensible instructions are available to staff and students on the use of heating controls.	No Room Heater i s in use.	NA

	Encourage staff, students and conference guests to save energy through visible reminders, incentives and information to increase awareness. This particularly concerns turning off electrical appliances when not in use in both communal and residential rooms	Misuse of electricity is controlled by turning off the appliances when not required. Visible reminders are placed above every switch to turn off lights when not in use.	YES
	Monitor and understand the importance of different sources of college energy consumption, and set appropriate and measurable targets for a reduction in certain areas of consumption and/or in the overall consumption of energy.	Disconnect the supply of electricity when not required.(especially during the month long winter vacation).	YES
	Conduct switch off drills at regular intervals	College conducts switch off drills at regular intervals.	YES
	Ensures that all electronic and electrical equipment's, such as computers, are switched off when not in use, and is generally configured in power saving mode when such option is available	All electronic and electrical equipment are switched off when not in use. Equipment are configured in power saving mode when such option is available.	YES
	If there are equipment's running on standby mode, reduce the energy consumption on standby mode or minimize the running of equipment's on standby mode	Equipment running on standby mode.	YES

Annual energy savings if the college's switch from CFL bulbs to LED lights

1. Power saved per LED = 24 W (CFL) - 11 W (LED) = 13 W
2. Expected power saving on shift from CFL to LED = 0.013kW for each CFL
3. Average use of CFL per year = 230 days/year x 6 hours/day = 1380 hours
4. Energy saved per year for each CFL = 0.013 kW x 1380 hours = 17.94 kWh
5. Saving of Rs per year for each CFL = 17.94 kWh x Rs. 9/kWh = Rs. 161.46/-

Installation of Solar PV cell

Initiative to reduce wastage of electricity

4.0 Waste Management Audit

Anthropogenic and natural modes are there for the production of the so-called 'unwanted' substances known as wastes. There are different types of anthropogenic wastes which include municipal solid waste (MSW), bio-medical waste (BMW), construction and demolition (C&D) waste, e-waste, industrial waste, and hazardous waste by virtue of their nature. Solid and liquid forms of waste are produced mainly as a result of manmade activities. Scientific and effective management of waste is one of the prior areas for attaining sustainability. Waste management is a serious concern for major countries and governments across the globe. A major share of finance is always allotted or used for the solid waste management of various systems. In many parts of the world, biodegradable waste is occupying a major share of the solid wastes produced. There are many options for sustainable management of biodegradable wastes and such methods are always well appreciated by the governments and concerned departments in the form of fund relaxations or subsidies. Non-biodegradable wastes are also a serious concern, especially in the case of single-use plastics. Presently there is a lack of an effective alternative for plastics which is the main reason behind the extensive and excessive use of single-use plastics. Researchers are seriously trying to find an effective alternative to plastics.

This audit addresses waste production and disposal of different wastes like paper, food, plastic, biodegradable, construction, glass, dust etc. and recycling. Furthermore, solid waste often includes wasted material resources that could otherwise be channeled into better service through recycling, repair, and reuse. Solid waste generation and management is a burning issue. Unscientific handling of solid waste can create threat to everyone. The survey focused on volume, type and current management practice of solid waste generated in the campus. The different solid wastes collected as mentioned above.

A waste management audit is a process for assessing an institution/organization's waste management strategies and actions. The aim is to find out the various types and quantities of waste (paper, plastic, food, e-waste, hazardous, etc.) produced within the campus, during a specific period. The generation of waste types and waste amounts are explained by the process of waste management audit. The audit can bring to attention the current waste performances of the firm, and the existing loopholes of the system and can recommend scientific and sustainable alternatives to address the existing problems.

4.1 Significance of Waste Management Audit

- Improper waste management practices can deteriorate the overall environmental status of the campus.
- Waste audit supports a firm to understand the pros and cons of existing waste management systems in the organization.
- Waste auditing helps an organization to adopt better waste management options.
- Enhancing reduce, reuse and recycling practices.
- Overall improvement of the environment.

4.2 Objectives of Waste Management audit

- To investigate the current status of solid and liquid waste generated in the campus.
- To examine the status of biodegradable and non-biodegradable waste
- To appraise the prevailing waste disposal methods and suggest measures to improve the existing waste management strategies.

4.3 Waste Conservation

Good waste management does more than just clean up the environment – it can also provide diverse benefits for communities that engage in waste management activities.

The broader challenge towards the waste management is to develop local/institutional waste management strategies and to embed local processes to ensure sustainability.

4.4 Observations

The total solid waste collected in the campus is 16 Kg/day. Waste generation from tree droppings and lawn management is a major solid waste generated in the campus. The waste is segregated at source by providing separate recycle bins for Bio-degradable (Green colored bins) and Plastic waste (Blue colored bins). Single sided used papers reused for writing and printing in offices and all departments. Unimportant and non-confidential reports/ papers are sent for pulping and recycling after completion of their preservation period. Very less plastic waste (0.1Kg/day) is generated by some departments, office, garden etc. Metal waste is stored and given to authorized scrap agents for further processing. Few glass bottles are reused. The college has practice of paperless office work in administration as much as possible and as a result there is less carbon emission from printers, no carbon copy of bills, filling of cartridge outside the office (if necessary) is observed.

Solid waste from canteen like food wastes are stored in bins and later deposited in pits; these wastes and vegetable wastes are collected into pits for making compost. College has two pits measuring 36m^3 each, this compost is utilized in college gardens; liquid wastes are disposed carefully through well drainage system.

Types of Waste	Particulars	Disposal Method
Plastic waste	Pen, Refill, Plastic water bottles, Other plastic containers, Wrappers, etc.	**Collected by Panchayet**
Solid waste	Damaged furniture, Paper waste, Paper plates, Food waste	**Non bio degradable wastes are collected by Panchayet and bio wastes are disposed in the campus itself.**
Waste water	Washing, Bathrooms	**To septic tank**
Sanitary napkin	Pads from washrooms	**Vending machines incinerate. The ash can be flushed or used as manure.**
Food Waste	From canteen	**Disposed and composted in campus itself**
Waste Paper	**Old Newspapers, Answer sheets, assignments note etc.**	**Sold to the local venders for recycling.**

4.5 Recommendations

- Reduce the absolute amount of waste that is produced from college staff offices.
- Make full use of all recycling facilities provided by the Birpara Panchayet and private suppliers, including glass, cans, plastic bottles, batteries, print cartridges, cardboard and furniture.
- Provide sufficient, accessible and well-publicized collection points for recyclable waste, with responsibility for recycling clearly allocated.
- Single sided papers to be used for writing and photocopy.

4.6 Audit Framework and detailed findings: Waste Management

Control objective	Control(s)	Audit Observation	Conformity
Maximize the proportionof waste that isrecycled & minimize the quantity of non-recyclable refuse	Reduce the absolute amount of waste that is produced from college staff offices.	The college has to a certain level controlled the amount of waste that it produces from staff offices.	YES
	Make full use of all recycling facilities provided by Municipality and private suppliers, including glass, cans, plastic bottles, batteries, print cartridge, cardboard and furniture.	College uses the facilities provided by the local authority to recycle the wastes.	YES
	Compost, or cause to be composted, allorganic waste, green waste and un-recycled cardboard produced in or collected from kitchens, gardens, offices and rooms.	College has wastecomposting facility.	YES
	Recycle or safely dispose of white goods, computers and electrical appliances.	Safe disposal through authorized agents for computers and electrical wastes.	YES
	Use reusable resources and containers and avoid unnecessary packaging where possible	College tries to use reusable resources and avoid unnecessary packaging where possible	YES
	Always purchase recycled resources where these are both suitable and available.	College tries to purchase recycled resources where these are both suitable and available.	YES
	Provide sufficient, accessible and well-publicized collection points for recyclable waste, with responsibility for recycling clearly allocated	College has sufficient, accessible and well-publicized collection points for recyclable waste, with responsibility for recycling clearly Allocated	YES
	Make specific arrangements for events, such as cultural Events, internal and external seminars and conferences, where significant recyclable waste is likely to be produced, in order to both	College arranged the events with least production of waste.	YES

	minimize the waste produced and maximize what is recycled/reused.		
	Promote reuse of items and waste recycling among staff, students and conference guests through training, posters and incentives	College has promoted reuse of items and waste recycling among staff, students and conference guests through training, posters and Incentives	YES
	Adoption of paperless office to reduce waste.	College has implemented paperless office partially.	YES

Initiative to manage the solid waste

5.0 E-waste Management Audit

E-waste can be described as electronic equipment that is near or at the end of its useful life. E-waste makes up about 5% of all municipal solid waste worldwide but is much more hazardous than other waste because electronic components contain cadmium, lead, mercury, and Polychlorinated biphenyls (PCBs) that can damage human health and the environment.

5.1 E-waste Management System

Electronic waste or e-waste is generated when electronic and electrical equipment become unfit for their originally intended use or have crossed the expiry date. Computers, servers, mainframes, monitors, compact discs (CDs), printers, scanners, copiers, calculators, fax machines, battery cells, cellular phones, transceivers, TVs, iPods, medical apparatus, washing machines, refrigerators, and air conditioners are examples of e-waste (when unfit for use).

E-waste typically consists of metals, plastics, cathode ray tubes (CRTs), printed circuit boards, cables, and so on. Valuable metals such as copper, silver, gold, and platinum could be recovered from e-wastes, if they are scientifically processed. The presence of toxic substances such as liquid crystal, lithium, mercury, nickel, polychlorinated biphenyls (PCBs), selenium, arsenic, barium, brominated flame retardants, cadmium, chrome, cobalt, copper, and lead, makes it very hazardous, if e-waste is dismantled and processed in a crude manner with rudimentary techniques. E-waste poses a huge risk to humans, animals, and the environment. The presence of heavy metals and highly toxic substances such as mercury, lead, beryllium, and cadmium pose a significant threat to the environment even in minute quantities.

Consumers are the key to better management of e-waste. Initiatives such as Extended Producer Responsibility (EPR); Design for Environment (DfE); Reduce, Reuse, Recycle (3Rs), technology platform for linking the market facilitating a circular economy aim to encourage consumers to correctly dispose their e-waste, with increased reuse and recycling rates, and adopt sustainable consumer habits.

5.2 Observation

E-waste generated in the college is very less. It is handled, treated and disposed in scientific way. There are 120 computers (with TFT monitors), 20 printers and 02 photo copier are available in the college. The college generates some e-waste like chips, bulbs, circuit boards, mother boards, computers, batteries, relays, and switches. The non-working computers, spare parts and other non-working electrical equipment are stored in separate places. The college has intention to adopt the Buyback policy. E-waste handled is 50 kg (approx) per year and disposed off

through authorized vendors.

5.3 Recommendations

- Recycle or safely dispose of white goods, computers and electrical appliances.
- Use reusable resources and containers and avoid unnecessary packaging where possible. Always purchase recycled resources where these are both suitable and available.

5.4 Audit Framework and detailed findings: E Waste Management

Control objective	Control(s)	Audit Observation	Conformity
Reduce the E waste generation	Adoption of Extended Producer Responsibility (EPR), Design for Environment (DfE); Reduce, Reuse, Recycle (3Rs). The EPR is an environment protection strategy that makes the producer responsible for the entire life cycle of the product, especially for take back, recycle and final disposal of the product.	College has no specific policy for E waste management.	NO

6.0 Green area Management Audit

Biodiversity, the variety of life on Earth, is essential for the functioning and stability of ecosystems, providing numerous ecological, economic, and social benefits. However, in recent years, biodiversity loss has become a significant global concern due to human activities, such as habitat destruction, overexploitation of natural resources, pollution, and climate change. To address this issue effectively, there is a growing need to assess and monitor biodiversity through comprehensive evaluations known as biodiversity audits.

Biodiversity assessment involves the systematic collection and analysis of datato quantify and understand the diversity of species, ecosystems, and genetic variability within a given area. It serves as a fundamental tool for identifying and evaluating changes in biodiversity over time, identifying critical habitats and species, and setting conservation priorities. Biodiversity audits, on the other hand, are the specific processes by which organizations, governments, or conservation groups evaluate and measure the status of biodiversity within a defined region, be it a specific ecosystem, protected area, or an entirecountry.

The green area management includes the plants, greenery and sustainability of the campus to ensure that the buildings conform to green standards. This also helps in ensuring that the Environmental Policy is enacted, enforced and reviewed using various environmental awareness programs.

6.1 Green Area and Carbon Neutrality

Green spaces are important reservoirs of biodiversity, providing resources, ecosystem services and habitats for species of interest, improving functional and structural connectivity at the urban level.

Carbon neutrality is the goal of balancing the amount of carbon dioxide (CO_2) emitted with the amount absorbed from the atmosphere. It's an important policy for reducing global warming and other environmental issues.

6.2 Observations

There are 4.3 acres land is available as green area. Campus is located in the vicinity of different types of species of plants. The campus is enriched by different bio diversities like bryophytes, pteridophytes, arthropod, Mollusca and reptiles. Various tree plantation

programs are beingorganized at college campus. This program helps in encouraging eco-friendly environment which provides pure oxygen within the institute and awareness among local people. The plantation program includes various types of indigenous species of ornamental and medicinal wild plant species. There is garden which is maintained by the gardener. The NSS unit of the college and the members of Nature club of the college also look after the college greenery. The college has taxonomically identified all the plants available in the campus.

6.3 Recommendations

- Reviews periodically the list of trees planted in the garden, allot numbers to the trees and keep records. Give scientific names to the trees.
- Promote environmental awareness as a part of course work in various curricular areas, independent research projects, and community service.
- Create awareness of environmental sustainability and takes actions to ensure environmental sustainability.
- Establish a College Environmental Committee that will hold responsibility for the enactment, enforcement and review of the Environmental Policy if any. The Environmental Committee shall be the source of advice and guidance to staff and students on how to implement this Policy.
- Ensure that an audit is conducted annually and action is taken on the basis of audit report, recommendation and findings.

6.4 Audit Framework and detailed findings: Green Area Management

Control objective	Control(s)	Audit Observation	Conformity
Development of green area to compensate CO_2.	Proper Land use pattern to develop green area.	There is no proper land use policy of the college.	NO
	Proper Taxonomical identification of plants in the campus.	The plants inside the campus is identified and marked properly.	YES
	Conduct Environment Awareness program.	Environment Awareness program i s regularly organizedby the college authority.	YES


BIRPARA COLLEGE
SCIENCE BLOCK

6.6 Carbon footprint - emission & absorption

1. Electricity used per year –
   CO2 emission from Electricity (electricity used per year in kWh/1000) x 0.84
   = 9924 KWh/1000 x 0.84
   = 8.33 ton
2. LPG/CNG used per year –
   CO2 emission from LPG/PNG (LPG/PNG used per year in KG) x 2.99 /1000
   = (273 x 2.99)/1000
   = 0.82 ton
3. Diesel used per year
   CO2 emission from HDS (Diesel) (Diesel used per year in litres) x 2.68
   = 100 (approx.) x 2.68
   = 212.14 x 2.68
   = 0.26 ton
4. Transportation per year (car)
   CO2 emission from transportation (Bus and Car) College doesn't own any vehicles, so emission because of the transportation is Zero.

   Total CO2 emission per year = 9.41 TPA

6.7 Carbon absorption by flora in the college

There are 50 (approx) full grown trees and 50 (approx) semi grown trees of different species, on the campus spread over 2.49 acres.
Carbon absorption capacity of one full grown tree 22 kg CO2 per Year
Therefore, Carbon absorption capacity of 50 full-grown trees 50 x 22 kg CO2
=1.10 tons of CO_2 per Year
The carbon absorption capacity of 191 semi-grown trees is 50% of that of full-grown trees.
Hence the carbon absorption 50 x 11 kg of CO2 =0.50 tons of CO2 per Year
There are approximately Hedge Plants 500 of various species being raised in the gardens and grown in the areas where no buildings are built. Carbon absorption of bush plants varies widely with their species. Certain bushes absorb very high level of CO2 where as some others absorb very low level of CO2. In the absence of a detailed scientific study, 250g of CO_2, absorption is taken per bush per Year
Based on this, total carbon absorption of bushes is 500 x 250 g =0.125 tons of CO2
The lawns on the campus have grass and indigenous grass species and cover a total area of 1440 square meter. Carbon absorption capacity of a 10 sq. ft. area of lawn is 1 g per day.

Therefore, carbon absorption by lawn area= 1440 gm per day = 1.44 kg per day
=0.525 ton per year
Grand total of carbon absorption capacity of the campus is 2.25 TPA

7.0 Green Practices

"Going **green**" means to pursue knowledge and **practices** that can lead to more environmentally friendly and ecologically responsible decisions and lifestyles, which can help protect the environment and sustain its natural resources for current and future generations. Green Practice includes

1. **Green purchasing**
2. **Green transportation**
3. **Treatment of chemical waste**
4. **Campaign for Go Green**
5. **Green Policy**

7.1 Observation

Major Green practice Initiatives in the campus:

- Institute community Garden
- Recycling bin for e-waste
- Use of LED
- Restricted entry of vehicles
- Restricted Parking
- Usage of bicycles and public transport
- Pedestrian friendly Road
- Paperless office
- Plastic free campus

7.2 Recommendations

- The Environmental Protection Committee should be empowered to look after all the green practices in the college
- More Seminar/ workshop should be organized to create the awareness of Environmental conservation among the students and other stake holders**.**

7.3 Green Practice Audit

Control objective	Control(s)	Audit Observation	Conformity
Ensure that improvements, purchases and developments are environmentally sound	Seek and act upon professional advice in order to minimize the adverse environmental impact of any new developments and exceed government regulatory requirements. This includes efficient heating and water systems, appropriate space for recycling, and the use of recycled and/or sustainable building materials where possible.	The college has contacted and acts upon professional advice in order to minimize the adverse environmental impact of any new developments and Government regulatory requirements.	YES
	Purchase efficient and environmentally sound appliances	College is positive about increasing greenery by planting in front of the college and maintaining potted plants scientifically as much as possible.	YES
	Purchase food that has been produced and delivered with minimal impact on the environment, this includes buying locally produced, organic and free range food wherever possible	College does not purchase food stuff as the canteen facility is available from 10:45 am to 4:45 pm on all working days.	YES
Minimize the use of unsustainable transport	Make available information about bicycle and pedestrian routes, public transport services and car share schemes to staffand students.	The college is well connected with good surface transport. Faculty members, Office staff and students are attending the college by public transport or by own transport like motor cycle etc. A well maintained parking place of 259 sqm is available for the two wheelers and four wheelers.	YES
	Reduce the proportion of travel on College business carried out in private transport and eliminate unnecessary and inefficient use of college vehicles	No, college has no vehicle. College uses hired vehicle whenever it is required. Most of the time use Public transport for official works.	YES
	Promote car sharing / car pool among the students and facultymembers	Both students and faculty members use either public transport and very less own vehicle.	YES

Minimize the use of chemical pollutants	Ensure that all cleaning products used by college staff have a minimal detrimental impact on the environment, i.e. are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations	Negligible amount of washing liquids are used in the college and all the toilet cleaners are Eco friendly.	YES
	Reduce the practice of burning Plastic and other material that emits harmful gas on burning is prevented in the campus.	The college is plastic free zone.	YES
	Establish a Garden in the campus	The college has already maintained garden of 1440 sqm. 60 types of plants are there.	YES
	Minimize the use of fertilizers and pesticides in college grounds, opting for the use of compost produced on site wherever possible.	Negligible amount of fertilizers and pesticides are used in the college.	YES
	Encourage the faculties andstudents to plant trees in the garden.	Faculty members and students know the importance of the tree plantation.	YES
	Reviews periodically the list of trees planted in the garden.	Such review is conducted on frequent basis.	YES
	Conduct environmental awareness workshops as a part of the program.	The College regularly organizes camps, seminar, and workshops.	YES
Ensure that environmental awareness is created	Conduct events such as planttrees to spread environmental awareness among the students	The different groups of c ollege students usually do that.	YES
	Create awareness of environmental sustainability and takes actions to ensure environmental sustainability.	Seminars and awareness programmes are conducted on Nature and natural resources, wildlife for the Conservation of Biodiversity.	YES
	Reduce the rate of contributes to the depletion and degradation ofnatural resources	College does not directly or indirectly involve in depletion and degradation of natural resources.	YES

	Promote environmental awareness as a part of course work in various curricular areas, independent research projects, and community service	As per UGC guidelines the subject Environmental Studies is introduced in the curriculum of all the streams. Under this curriculum, students have to submit a project report based on the field study and the environmental data they have collected. The total marks allotted to this project/ fields study report is 20. Students appear for the written test where 80 marks are allotted.	YES
Ensure that the buildings conform to green standards.	Review architecture of existing buildings and reviews ways, in consultation with experts, to reduce usage of energy for such buildings, offering greatest efficiency for energy and water usage, and reducing carbon emission.	The college building is less than 25 years old and follows the standard architecture for the Hill area.	YES
Ensure that the Environmental Policy is enacted, enforced and reviewed	Establish a College Environmental Committee that will hold responsibility for the enactment, enforcement and review of the Environmental Policy. The Environmental Committee shall be the source of advice and guidance to staff and students on how to implement this Policy.	The college has Nature Club which looks after the Environment Protection and Campus Beautification. The club also regularly monitors and advocates for environment protection measures and development of green area.	YES
	Ensure that on the Nature Club there will be appropriate representatives of the relevant college departments and authorities – such as catering, gardening, maintenance, cleaning and finance	The college has its Nature Club comprising the staff and students of different departments.	YES
	Ensure that on the Environmental Committee there will be the Green Officer from an external agency who is engaged in the profession of providing guidance on environmental impact	The college has no such Green Officer.	NO
	Ensure that the Environmental Committee will review the Environmental Policy on an annual basis, and will	Environmental Protection Committee review the policy periodically.	YES

	monitor progress and set measurable targets wherever possible		
	Ensure that the Environmental Policy is enforced regardless of whether its requirements exceedthe mandate of the law	Environmental policy of the college: "No to water & Electricity misuse; Optimal waste management".	YES
	Require that every staff and student member recognizes their responsibility to ensure that the commitments in the Environmental Policy are properly put into practice	Every staff and student member recognize their responsibility to ensure their commitments to the Environment.	YES
	Ensure that an audit is conducted annually and action is taken on the basis of audit report, recommendation and findings	Green audit is conducted annually.	YES

Parking Area

Green Activities of Birpara College

8.0 Conclusion

Considering the fact that the institution is predominantly an under-graduate college, there is significant concern over the environmental conservation both by faculty and students. The environmental awareness initiatives are substantial. The installation of solar panels and efforts towards paperless work system are noteworthy. Besides, environmental awareness programmes initiated by the administration shows how the campus is going green. Few recommendations are added to curb the menace of waste management using Eco-friendly and scientific techniques. This may lead to a prosperous future in the context of Green Campus and thus sustainable environment and community development.

As part of green audit of the campus, we also carried out the environmental monitoring of campus which includes illumination, Noise level, and Ventilation and Indoor Air quality of the class room. It was observed that illumination and Ventilation is adequate considering natural light and air velocity present. Noise level in the campus is below 50 dB at day time which is well within the limit.

Sustainable Development Goals

Appendix 1: Air Quality

Device Location **Alipurduar District Police Lines**

Relative Humidity **78.88 %** Temperature **26.35 °C**

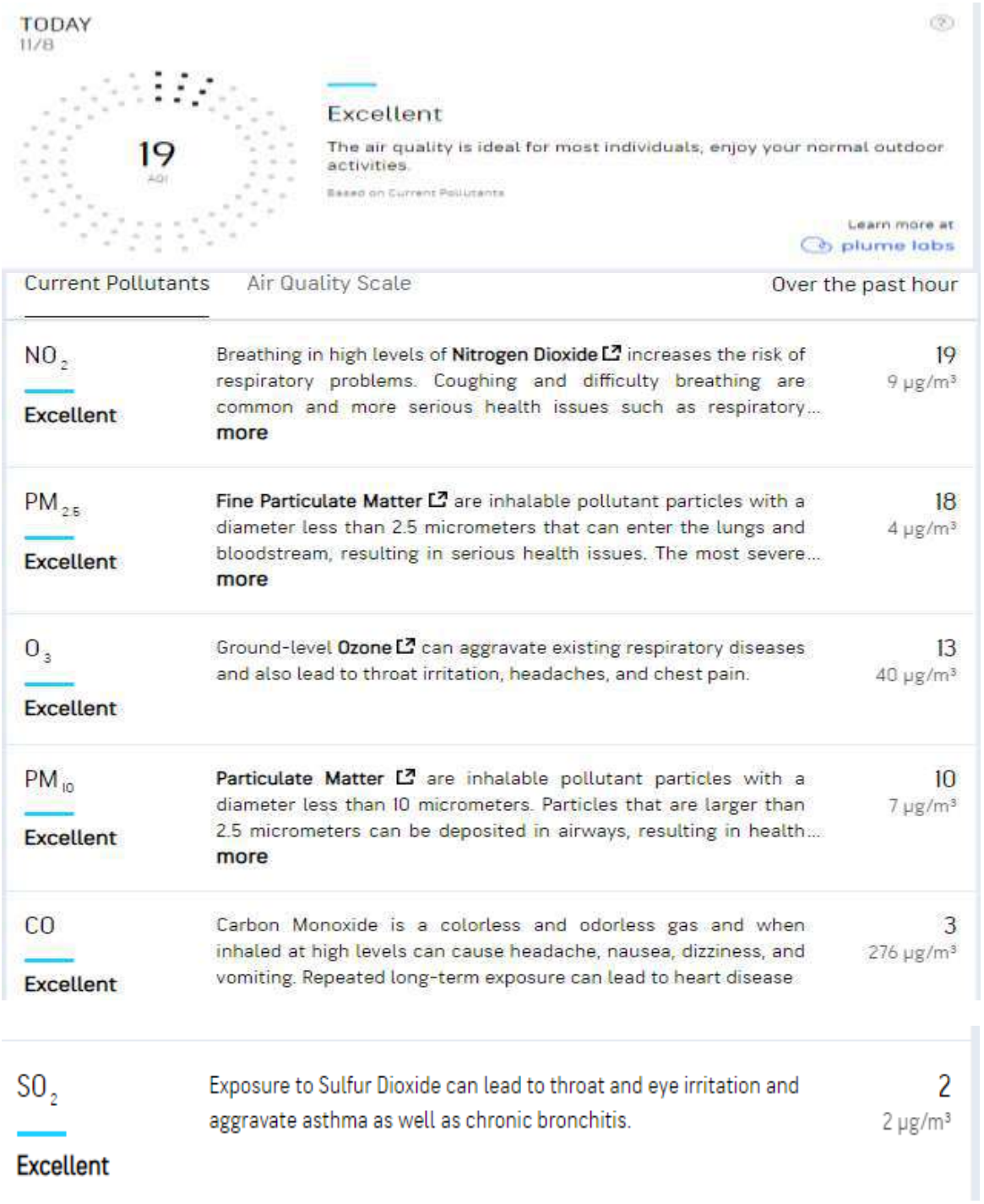
Latitude **26.4997480** Longitude **89.5303570** Date and Hour **2024-11-08, 17 hours**

Pollutant	Average	Minimum	Maximum
PM 2.5	24.75 µg/m^3	19.61 µg/m^3	38.63 µg/m^3
PM 10	43.89 µg/m^3	33.54 µg/m^3	70.57 µg/m^3
Temperature	26.59 °C	21.04 °C	33.87 °C
Humidity	77.29 %	50.79 %	91.32 %

Disclaimer: West Bengal pollution Control Board has developed a sensor based air pollution Monitoring network. The sensors are periodically calibrated against the reference-grade monitors and are being used for air quality management for the state. The data represent broad trends of air pollution in the locality.These data are being used for the purpose of research only and not to meant for regulatory intent.

24-Hourly NAAQS	
PM 2.5 (ug/m3)	PM 10 (ug/m3)
60	100

Source: West Bengal pollution Control Board


TODAY
11/8
19
AQI
Excellent
The air quality is ideal for most individuals, enjoy your normal outdoor activities.
Based on Current Pollutants
Learn more at
plume labs
Current Pollutants
Air Quality Scale
Over the past hour
NO2
Excellent
Breathing in high levels of Nitrogen Dioxide increases the risk of respiratory problems. Coughing and difficulty breathing are common and more serious health issues such as respiratory... more
19
9 µg/m³
PM2.5
Excellent
Fine Particulate Matter are inhalable pollutant particles with a diameter less than 2.5 micrometers that can enter the lungs and bloodstream, resulting in serious health issues. The most severe... more
18
4 µg/m³
O3
Excellent
Ground-level Ozone can aggravate existing respiratory diseases and also lead to throat irritation, headaches, and chest pain.
13
40 µg/m³
PM10
Excellent
Particulate Matter are inhalable pollutant particles with a diameter less than 10 micrometers. Particles that are larger than 2.5 micrometers can be deposited in airways, resulting in health... more
10
7 µg/m³
CO
Excellent
Carbon Monoxide is a colorless and odorless gas and when inhaled at high levels can cause headache, nausea, dizziness, and vomiting. Repeated long-term exposure can lead to heart disease
3
276 µg/m³
SO2
Excellent
Exposure to Sulfur Dioxide can lead to throat and eye irritation and aggravate asthma as well as chronic bronchitis.
2
2 µg/m³

Appendix 2: Noise Quality

Noise Level 54.63 db(A)

Device **Alipurduar District Police Lines**

Zone **Commercial**

District **Alipurduar**

Timestamp **November 8th 2024, 5:50 pm**

Parameter	Value
LAs	59.67
LCs	59.52
LZs	60.78
LAeqt	54.63
LCeqt	58.38
LZeqt	58.38
LApeakt	91.74
LCpeakt	97.68
LZpeakt	98.00

National Noise Standard

Noise Limit	DAY (6 AM - 10 PM) in dB(A)	NIGHT (10 PM - 6 AM) in dB(A)
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence	50	40

Source: West Bengal pollution Control Board

Appendix 3: Water Quality Parameter

Parameter	Bureau of Indian Standards (BIS 2009) acceptable limit	WHO standard 2011 desirable limit
pH	6.5 - 8.5	7.0 - 8.5
TDS	500	600
Alkalinity	200	300
DO	5	NA
EC	750	750
Salinity	100 PPT	100 PPT
Turbidity	1 NTU	1 NTU
Na^{+}	200	50
Mg^{2+}	30	30
Ca^{2+}	75	100
F^{-}	1	1.5
Cl^{-}	250	250
NO_3^{2-}	50	50
SO_4^{2-}	200	250

NA - Not Available

Appendix: Water testing report (Method followed: APHA) as per IS: 10500-2021