Post Graduate Government College for Girls, Sector 42, Chandigarh

Affiliated to Panjab University, Chandigarh

NAAC Accredited 'A' Grade (CGPA – 3.21)

AISHE Code : C-29391

Internal Quality Assurance Cell (IQAC)

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Green Audit Report

for

Govt. PG College for Girls

Sector - 42, Chandigarh - 160036

Prepared &Submitted By

ECO LABORATORIES & CONSULTANTS PVT. LTD.

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Executive Summery

Executive Summary

A Nation's growth starts from its educational institutions, where the ecology is thought as a prime factor of development associated with environment. A clean and healthy environment aids effective learning and provides a conducive learning environment. Educational institutions now a day are becoming more sensitive to environmental factors and more concepts are being introduced to make them eco-friendly.

To preserve the environment within the campus, various viewpoints are applied by the several educational institutes to solve their environmental problems such as promotion of the energy savings, recycle of waste, water reduction, water harvesting etc. The activities pursued by institutes can also create a variety of adverse environmental impacts. To protect such situation Energy Audit, Green Audit and Environment Audit are required to be conducted in these institutions. Energy Audit pave the way to save energy consequently reducing Carbon Emissions. Environmental auditing is a process whereby an organization's environmental performance is tested against its environmental policies and objectives. Green audit is defined as an official examination of the effects an institute has on the environment. It must also be under stood that Energy Audit, Green Audit and Environment Audit are inter related to each other. If you save Energy, it will save Environment. If you save trees or plant trees, it will save Environment and energy. If you clean Environment, it will save human life and save energy.

Eco campus is a concept implemented in many educational institutions, all over the world to make them sustainable because of their mass resource utilization and waste discharge in to the environment. Waste minimization plans for the educational institute are now mandatory to maintain the cleanliness of the campus. To find out the environmental performance of the educational institutions and to analyze the possible solutions for converting the educational campus as eco-campus the conduction of Green Auditing of institution is essential.

The green auditing of Govt. PG College for Girls, Chandigarh enables to assess the life style, action and its impact on the environment. This is the first attempt to conduct green auditing of this College campus. This audit was mainly focused on greening indicators like consumption of energy in terms of electricity and fossil fuel, quality of soil and water, vegetation, waste management practices and carbon foot print of the campus etc. Initially a questionnaire survey was conducted to know about the existing resources of the campus and resource consumption pattern of the students and staffs in the campus. In order to assess the environmental quality for

ambient air, noise, water, soil, wastes and indoor lux levels, the samples were collected from different locations of the College campus and analyzed for its parameters. Finally, a report pertaining environmental management plan with strength, weakness and suggestion on the environmental issue of campus are documented.

Green Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. The 'Green Audit' aims to analyze the environmental practices within and outside the institutional 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.

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 audit is assigned to the criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India which declares the institutions as Grade A, B or C according to the scores assigned during the accreditation.

Thus, it is imperative that the College evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

About Govt. PG College for Girls, Chandigarh

About PG Government College for Girls

PG Government College for Girls, Sector-42, affiliated to Panjab University, Chandigarh, is a premier institute of higher education in Northern India. Spread over a sprawling campus of approximately 18 acres, adjacent to the International Heritage Palm Garden, the College is situated in southern part of Chandigarh- the City Beautiful with its imposing edifice, majestic building- blocks and rich infrastructure, it caters to the academic and professional needs of girls not only from Chandigarh and adjoining rural areas but also from different states of India. Established in a school building in Sector-19 in the year 1982 with Arts and Commerce faculties, the College shifted to its present campus in the year 1987. Since then, it has been making strides in terms of academic and infrastructural up-gradation which has enabled it to emerge as a fore-runner in Women empowerment and Education. The College has been accredited Grade A by the National Accreditation and Assessment Council (NAAC) in the year 2015. It has been placed in the Rank Band between 151-200 during National Institutional Ranking Framework (NIRF) 2020. The College has been selected under the various schemes of Govt. of India i.e., Rashtriya Uchchatar Shiksha Abhiyan, Unnat Bharat Abhiyan, Swachch Bharat Abhhiyan, DST-FIST Program, Ek Bharat Shreshtha Bharat.

The College offers Doctorate Programme in Zoology and number of courses in the faculties of Arts, Commerce, Science (Medical, Non-Medical, Biotechnology (Honours and Elective), Bioinformatics, Microbiology, Computer Science, Information Technology and B.C.A. at Under-graduation level and Post-Graduation in Commerce, English, Public Administration, Sociology, Political Science, Zoology, Botany, Microbial Biotechnology, Information Technology, Computer Applications, Mass Communication, Guidance &Counseling, Translation and B.P.Ed. (Two Years). As many as 182 subject combinations in Humanities, 10 in Science, honours in 13 and 01 in commerce subject can be opted by students. The students can also avail 11 Career/Job Oriented Add-on Courses and thus they gain dual degree on graduating. These Add-on courses include Bioinformatics, Environmental Auditing,

Tourism and Travel Management, Event Management, Mass Communication and Video Production, Animation and Graphics, Web Designing and Multimedia, Entrepreneurship, Disaster Management and Music (Vocal and Instrumental). Under RUSA scheme of Govt.of India, a detailed IDP has already been submitted to start Finishing School on the campus. Making a humble beginning with 300 students and 14 faculty members in 1982, today the College has a strength of more than 4000 students. A team of 103 dedicated and well qualified faculty members facilitate effectual teaching and contribute in shaping the Next Generation. The College

has 04 Professors, 29 Associate Professors and 70 Assistant Professors which include 57 Ph.D. and 17 M.Phil. degree holders. More than 71 non-teaching staff members provide assistance in the better functioning of the College.

The College has made a niche for itself in the northern region because of its infrastructure, multi-talented faculty and array of courses offered. Embellished with well-maintained 9 gardens, vast playgrounds, 100 mbps lease line, an exclusive Information Technology Block with cutting edge facilities; a well-equipped fully air-conditioned library with a compendium of more than 41,000 books and journals, equipped with INFLIBNET, RIFD, browsing facility, gymnasium, Wi-Fi hostel facility with all modern amenities, stationery shop; food court and fruit & juice stall, State-of-The-Art auditorium 'SABRAS' inaugurated by Shri.Kiren Rijiju, Hon'ble Union Minister of State for Human Affairs, Govt. of India, Life Sciences Research lab and day care Centre. An in house 200 kWP SPV Power Plant, a vision project of the Chandigarh Renewal Energy Science & Technology Promotion Society with a provision of 800 SPV panels. Continuous efforts are being made to further augment the resources keeping in with the scientific and technological advances and growing needs and aspirations of the youth.

To impart holistic training, the College undertakes extension activities through eight units of N.S.S., one unit of NCC (Army Wing), twelve societies and departmental activities. Various societies such as Aids Awareness, Best Out of Waste, Commerce Society, Community Hygiene and Sanitation, Cultural and Heritage, Drug De-Addiction, Environment, Gender Equity and Women Empowerment, Literary, Olympism, Science and Traffic Awareness Society that aids the students to sensitize about major personal, social and health issues. The College magazine "SHIKHAR", the College newsletter, 'Scoop' and the departmental activities all provide the students a platform to hone their potential and capabilities. The College Career Counselling and Placement Cell, Anti-Ragging Committee, Entrepreneurship Development Cell, Anti-Stress Helpline, and Anti-Sexual Harassment committee function in tandem with various departments to facilitate students.

A vibrant relationship between the teachers and students has enabled us to clinch as many as 100 merit positions in the Panjab University examinations. The students were awarded medals in different categories under sports. They were given 05 Gold, 04 Silver and 25 Bronze in Roll of Honour, 10 Gold, 12 Silver and 48 Bronze under College Colour, 02 second prize and 15 third positions where in students have won innumerable accolades at national and international level in various sports events. The College motto "Higher Still" is the guiding principle behind our endeavour to strive, excel and achieve distinction. The College aims at providing a conducive

environment to augment holistic growth, and personal development of the students and to provide them a platform to blossom into responsible and confident young girls who can live a life of dignity and make meaningful contribution to society.

Facilities

- Sprawling 18 acres Campus
- Exclusive IT Block
- 'SABRAS'-State-of-the-Art College Auditorium
- Automated Air-Conditioned Library
- Multimedia Room
- Conference Room
- Seminar Room
- Smart Class Rooms
- Air-Conditioned Gymnasium with indoor sports facility
- Fully Equipped Computer, Language and Science Laboratories
- CCTV: 24*7 Surveillance Facility
- High Speed Wi-Fi Connectivity
- Day Care Centre
- Research Lab
- Spacious, Hygienic Food Court
- Minimart: Shops for Books, Stationary, Photostat, Daily Needs
- Beautiful Landscaped Parks
- On-Campus ATM Facility
- Facilities for Physically Challenged/Visually Impaired Students (Ramps, Washrooms, Wheelchair, Tactile Paving)

Overview of Facilities

	
College	Library
	
Hostel	Sports
	
Labs	Student Corner
	
On-Campus ATM	Placement Cell

Fig. 1: Overview of Facilities

Library

"One Best Book is equal to Hundred Good Friends; One Good Friend is equal to a Library." -Dr. A.P.J. Abdul Kalam.

The Library of PGGCG-42 in a hall measuring 100x45 sq. ft. on the second floor of the main building of the college. The Library Hall is surrounded by noise free and inviting reading environment for the readers. The library is divided in six sections namely Circulation Area, Stack Area, Reference Section, Reading Area, Digital Lounge and Newspaper & Magazine Section. The Library Hall has the facility to accommodate about 250 readers at a time to access the information resources available in the library. The library operates from 9.00 am to 4.00 pm on all working days. The budget allocation for collection development is made available by the college, and RUSA and UGC from time to time.

Vision

The library of the college aims to be the best in providing access to the world of information technology application. Our Inspiration are "The five laws of Library Science" enunciated by Dr S R Ranganathan, the father of Library Science in India.

- Books are for use
- Every reader his/her book
- Every book its reader
- Save the time of the reader
- Library is a growing organism

Highlights About the Library

- Fully Air Conditioned
- More than 41,000 Subject and Reference books, 71 Magazines, 14 Subject Journals and 17 Newspapers in Hindi, English and Punjabi
- Digital Corner
- Rare Books
- Access to INFLIBNET N-LIST
- Web-OPAC: Web Online Public Access Catalogue facility
- Fully Automated library with LIBSYS: Web Based Library Management Software

- JAWS: Braille Software to cater to the needs of visually challenged students
- Internet and Photocopier facility for the convenience of students
- Computer Cabins for PG/ Research Scholars
- Separate Room for Magazines/ Journals/ Newspapers

Library Services

- Lending Service
- Current Awareness Service
- OPAC Search
- Reference & Information Service
- E-mail Service for every transaction
- Plagiarism Check

Library Service Type	Existing		Newly Added		Total	
Text Books	40741	4576458	482	272368	41223	4848826
Journals	84	95126	2	4400	86	99526

Activities

- Display of BOOKS/PERIODICALS - New arrivals are displayed in the library
- BOOK EXHIBITIONS - The Library organizes display of books out of existing collection on various national and international days.
- ORIENTATION PROGRAMME - At the beginning of the session, the new students are acquainted about the library and its services.
- LIBRARY RELATED COMPETITIONS - The library has the tradition of organizing library related competitions to create interest amongst the students in reading good books and location of valuable information in the library collection.

Courses Offered by College

Doctorate Programme

- Ph.D. (Zoology)

Master's Degree Programme

- M.A. English
- M.A. Political Science
- M.A. Public Administration
- M.A. Sociology
- M.Com.
- M.Sc. Information Technology

PG Diploma Programmes

- PG Diploma in Computer Applications
- PG Diploma in Guidance & Counseling
- PG Diploma in Mass Communication
- PG Diploma in Translation (English to Hindi)

Bachelor's Degree Programmes

- B.A
- B.A. (Information Technology Elective)
- B.C.A
- B.Com
- B.Sc. Non-Medical
- B.Sc. Non-Medical (Computer Science Elective)
- B.Sc. Non-Medical (Information Technology Elective)
- B.Sc. Medical
- B.Sc. Medical (Bioinformatics Elective)
- B.Sc. Medical (Biotechnology Elective)
- B.Sc. Medical (Microbiology Elective)
- B.Sc. (Biotechnology Honours)
- B.P.Ed. (Two Years)

B.A. Honours

- Dance
- Economics
- English
- Geography
- Hindi
- History
- Music (Vocal)
- Punjabi
- Political Science
- Psychology
- Public Administration
- Sanskrit
- Sociology

B.Com. Honours

- Management Studies

Add-On / Career Oriented Programmes

- Animation and Graphics
- Bioinformatics
- Cosmetology
- Disaster Management
- Entrepreneurship
- Environmental Auditing
- Event Management
- Mass Communication and Video Production
- Music (Vocal & Instrumental)
- Tourism and Travel Management
- Web Designing and Multimedia

Mission and Vision of College

Vision:

To empower young girls through education, thereby enabling them to be the agents of progress, to better lives and society.

Mission:

- To impart holistic education to young women from all strata of society and facilitate them to develop as intellectually mature, morally upright, socially responsible and spiritually inspired women leaders to serve the society.
- To motivate research and innovative teaching /learning practices and to engage in widening the frontiers of knowledge.
- The college motto "Higher Still" reiterates our commitment to strive for excellence.

Major Thrust Areas of College

Solid Waste Management

An efficient solid waste management system has been set up in the college by adopting several environment friendly projects. The waste generated in the college is segregated on a daily basis as wet and dry waste, in green and blue coloured dustbins respectively, installed at different places. By using these dustbins our college promotes the concept of "segregation of waste at the source". Dry waste includes paper, cardboard, glass, tin cans etc. whereas wet waste refers to organic biodegradable waste such as kitchen waste, left-over food, garden waste etc. Wet waste being biodegradable in nature is converted to nutrient rich compost by eco-friendly methods of composting, while dry waste is disposed of with the help of authorized agencies. We practice different composting strategies such as Pit composting, In-vessel composting and Vermi-composting. Students of the Biotechnology Department are involved in the composting process as a part of their training program. By practicing these students learn various techniques related to composting which can become a good entrepreneurship option for them in future.

Pit composting is done using pits dug in the botanical garden. Green waste from college lawns and kitchen waste from hostel mess is composted in these pits by microbial action. In-vessel composting is done by using Khambas (a patented product obtained from Daily Dump Organization) to compost biodegradable waste generated in the canteen and juice corner. Vermi-composting unit has also been established in the Botanical garden where biodegradable waste

is converted to compost with the help of red worms or tiger worms. The compost is utilized by the garden committee in maintaining the beautiful, extensive college lawns. It helps in luxuriant growth of plants, besides reducing the reliance on purchase of compost from outside sources. This compost is also sold in college to the general public and profits earned are used for the maintenance of composting units.

Internal Quality Assurance Cell (IQAC)

The college IQAC has worked out an action plan for up gradation of existing learning resource for imparting quality teaching and enhancement. As the name reflects IQAC- internal quality Assurance Cell, continuously working on providing quality education, adopting innovative teaching learning methods and assessing them in the college. College IQAC Cell is conducting FDP's / workshops for quality education and preparing the most important Quality report AQAR as per NAAC instructions.

Quality Assurance Initiatives of the Institution - Indicative list

- Regular meeting of Internal Quality Assurance Cell (IQAC)
- Timely submission of Annual Quality Assurance Report (AQAR) to NAAC
- Awareness about various schemes of UGC/CSIR/DST/DBT/Panjab University etc. regarding research projects for the faculty.
- Feedback from all stakeholders collected, analysed and used for improvements
- Participation in NIRF
- Regular Water Audit
- MoU with IT and Agro based companies
- Environmental auditing
- Awareness about Student Satisfaction Survey and data collection through Google form.
- Establishment of fruit garden in the college campus to be looked after by the department of BCA.
- Suggestion/ Complaint/ Happiness box for students
- Encouraging the concept of GIVE PAPER BACK – for reusing unused sheets from partially used notebooks and answer books.
- Capacity Building Workshops, Webinars and Expert talks on Skill Development, Start-up India, Literature, Creativity etc. to empower students.

- Celebration of days of National Importance.
- Anti-Plagiarism software "Urkund" was purchased to promote the quality research.

Table 1: Plan of action chalked out by the IQAC in the beginning of the academic year towards Quality Enhancement and outcome achieved by the end of the academic year	
Plan of Action	**Achievements/Outcomes**
Infrastructure	**Infrastructure**
The college IQAC has worked out an action plan for up gradation of existing learning resource for imparting quality teaching and enhancement. Also, due to pandemic some of the projects that were due for completion could not be completed within the stipulated time period. The college proposes to complete the delayed projects in this session.	As per plan laid down by the IQAC following were the achievements during the year 2019-2020
1. Completion of Installation of lift under RUSA Infrastructural Grant in the IT Block to make it friendly for differently-abled students/employees	1. Renovation of Class IV employee Houses done under 4202.
2. Provision for furnishing and fitting of the Mini Conference Room renovated under RUSA.	2. Rewiring of electrical installations and replacement of tube fitting with LED fixtures done in IT Block under 4202.
3. Upgradation of existing network from 10 mbps to 100 mbps.	3. Bandwidth was increased from 10 mbps to 100 mbps to cope up with increased requirement because of COVID.
4. Construction of a cycle track to promote physical activity.	4. Purchase and installation of Generator Set for Auditorium block completed
5. Construction of a synthetic Lawn Tennis Court under 4202 in order to promote the game.	5.Old and defective ceiling fans replaced and AC points provided in administrative block and Science block.
6. Construction of a synthetic Badminton Court under 4202 on the campus.	6. Renovation of washrooms for students in science block done under 4202.
7. Installation of chain link fencing of Basketball court under 4202.	7. Redesigning and extension of services in college website www.gcg42.ac.in
8. Proposal for setting up of Golf putting range under RUSA Infrastructural Grant.	8. Foundation Laying Ceremony of the new Girls hostel was done in September 2020
9. Proposal for Setting up of a Cricket pitch and Cricket net under RUSA Infrastructural Grant for in house practice.	9. RFID facility installed in the library

10. Proposal for the construction of new girls hostel building for meeting the increased demand of outstation students.	10. The work of renovation of ground floor corridor of science block and porch area of the college is complete.
11. Proposal for Renovation of washrooms for students (44 WC) in Arts block under 4202.	
12. Renovation of ground floor corridor of science block and porch area of the college.	
Academic Programmes	**Academic Programmes**
1.To initiate the process of Academic Administrative Audit (AAA).	1. Two new PG courses i.e. MA Punjabi and MA History started.
2. Proposal to design and prepare online Joint Prospectus for UG and PG courses of city colleges for session 2020-2021.	2. College successfully designed, prepared and launched joint prospectus of city colleges for session 2019-2020.
2. Preparing of IQAC News Letter.	3. Capacity Building Programme on Curriculum Reforms and Latest QIF of NAAC conducted.
3. To conduct Capacity Building Programme on Curriculum Reforms and Latest QIF of NAAC.	4. College participated in Star College Scheme of DBT.
4. To encourage faculty to conduct research and apply for research projects.	5. A faculty member was granted a research project under IMPRESS scheme of MHRD for research.
5. To facilitate participation of the college in NIRF.	6. College participated in Ministry of Education Ranking Framework NIRF.
6. Proposal for subscription of Urkund – anti plagiarism software recommended by UGC.	7. College constituted a separate committee to collect data on Student Satisfaction using google form as per the criterion 2 - Student Satisfaction Survey. More than 50% students participated in the survey and suggested constructive improvement in the college academic and physical infrastructure.
7. Signing MoUs with Industries and Institutes of repute.	8. Subscription of G-Suite for education was taken for online classes.
8. Subscription of G-suite for online classes/webinars.	9. Faculty was provided training to take online classes using G-suite/Microsoft Teams.
9. Upgradations of ICT facility by purchasing of computers, printers and MS Office	10.Urkund – anti plagiarism software was purchased.
10. Upgradations of Network infrastructure	
11. To provide training to the faculty to take online classes using G-suite/Microsoft Teams	
Eco-Friendly Campus	**Eco-Friendly Campus**
	1. College participated in Swachchta Ranking.

1. To continuously carry out tree plantation drive inside and outside campus to increase college green cover.	2. Fruit Garden setup and maintained by the students of Computer Applications.
2. To increase flower beds in the college campus for beautification.	3. Regular water audit of drinking water.
3. Regular water audit of drinking water.	4. Multiple tree plantation drives were held under Shristi-Environment Society campus to increase college green cover.
Enabling Environment for Holistic Development	**Enabling Environment for Holistic Development**
1. Encourage Community Outreach Programmes as per vision of Ministry of Education and Govt. of India.	1. Various Community Outreach Programmes as per vision of Ministry of Education and Govt. of India held.
2. To undertake and initiate Women Empowerment Activities through awareness programmes, Youth Adalat and Counselling.	2. Panjab University Zonal Youth and Heritage Festival, Chandigarh Zone B conducted in September 2019.
3. To undertake Career Guidance & Counselling sessions on regular basis.	3. To undertake and initiate Women Empowerment Activities through awareness programmes, Youth Adalat and Counselling.
4. Placement Initiatives for students' career enhancement.	4. To undertake Career Guidance & Counselling sessions on regular basis.
5. Celebrating days of National Importance.	5. Regular Placement Initiatives and opportunities shared with students.
6. To organize various talk/ lectures / seminars/webinars to improve communication skills and overall personality development of students.	6. Celebrated days of National Importance with zeal and enthusiasm with students and staff.
	7. Organized various talk/ lectures / seminars/webinars to improve communication skills and overall personality development of students.

Table 2: Meeting of IQAC Members

OFFICE OF THE PRINCIPAL, PG. GOVT COLLEGE FOR GIRLS,
SECTOR-42, CHANDIGARH
NOTICE

Memo No: PGGCG-42/STENO/2021/204 Date-28/10/2021

A meeting of the Internal Quality Assurance Cell (IQAC) will be held on 30/10/2021 at 12:00 N
Conference Room (I.T Block). The following members are requested to attend the same.

Sr. No	Name	Designation	IQAC	Signature	Mobil
1.	Prof. Nisha Aggarwal	Principal	Chairperson	Nisha Aggarwal	9888
2.	Prof. Binu Dogra	Former Principal	Member	Dogra	987
3.	Mr. Hardeep Singh	Deputy Mayor, M.C, Chandigarh	Member	Hardeep Singh	9915
4.	Mrs. Mridula Dang	CFO, Law Firms	Member	Mridula.	9810
5.	Mr. Mohan Lal	Registrar Education (Colleges) O/o Director Higher Education	Member		9041
6.	Prof. Lakhvir Singh	Incharge Placement Cell and HOD Sanskrit &Hindi, ASPD RUSA	Coordinator NAAC	Lakhvir Singh	94
7.	Mr. Suresh Kumar	Dean, HOD Physics	Co-coordinator NAAC	Kumar	9417
8.	Mr. Jagan Nath	Vice-Principal, Student Council &HOD Pub Admn	Co-coordinator NAAC		9417
9.	Prof. Deepika Kansal	Incharge Time Table & Registrar Exams, HOD Chemistry	Co-coordinator NAAC		985
10.	Ms. Paramjeet Kaur	Bursar	Member	Paramjeet	95
11.	Dr. Seema Gupta	Incharge Hostel Welfare	Member	On leave Tomorrow	8847
12.	Ms. Jasreet Kaur	Incharge Women Cell	Member	Jkaur	978
13.	Dr. Shweta Bali	Incharge IT, HOD BCA, RUSAIn charge	Member	Bali	9780
14.	Dr. Manpreet Kaur	HOD, Home Science& UGC Incharge	Member	Sorry, I am on leave	9814
15.	Dr. Kanchan Singh	Staff Secretary	Member	KSW	987
16.	Dr. Preeti Sharda	Librarian	Member	Sharda	941
17.	Ms. Santosh Joshi	Supdt. Establishment	Member		988
18.	Mrs. Gurmeet Kaur	Supdt. Accounts	Member	G.K	98
19.	Ms. Savita Machra	Alumni	Member 7837906861		783
20.	Ms. Ishita Thakur	Student Council (PG) M.A-II Public Admn Roll no. 204116	Member 8278807093		827
21.	Ms. Samridhi	Student Council (UG) B. Com-III Roll No. 191063	Member 7009858343	Samridhi	700

Nisha Aggarwal
Principal
PG. Govt College for Girls
Sector -42, Chandigarh

Overview of Faculties (Departments/Blocks) included in Green Audit

Fig. 2: Overview of Department/Blocks involved in Green Audit

About Green Audit

About Green Audit

Green Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. The 'Green Audit' aims to analyze the environmental practices within and outside the institutional 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.

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 audit is assigned to the criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India which declares the institutions as Grade A, B or C according to the scores assigned during the accreditation.

Thus it is imperative that the College evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

Scope and Goals of Green Audit

A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues. Green Audit is the most efficient and ecological way to manage environmental problems. It is a kind of professional care which is the responsibility of each individual who are the part of economic, financial, social, environmental factor. It is necessary to conduct green audit in institute campus because students become aware of the green audit, its advantages to save the planet and they become good citizen of our country. Thus Green audit becomes necessary at the institute level.

Objectives of Green Audit

The main aim objectives of this green audit are to assess the environmental quality and the management strategies being implemented in college campus. The specific objectives are:

- To assess the quality of the water and soil in college campus
- To monitor the energy consumption pattern of the institute
- To quantify the liquid and solid waste generation and management plans in the campus.

- To assess the carbon foot print of the campus
- To assess whether the measures implemented by the College campus have helped to reduce the Carbon Footprint.
- To impart environment management plans of College
- Providing a database for corrective actions and future plans.
- To assess whether extracurricular activities of the Institution support the collection, recovery, reuse and recycling of solid wastes.
- To identify the gap areas and suggest recommendations to improve the Green Campus the institute.

Benefits of Green Auditing

- More efficient resource management
- To provide basis for improved sustainability
- To create a green campus
- To enable waste management through reduction of waste generation, solid-waste and water recycling
- To create plastic free campus and evolve health consciousness among the stakeholders
- Recognize the cost saving methods through waste minimizing and managing
- Authenticate conformity with the implemented laws
- Empower the organizations to frame a better environmental performance
- Enhance the alertness for environmental guidelines and duties
- Impart environmental education through systematic environmental management approach and improving environmental standards
- Benchmarking for environmental protection initiatives
- Financial savings through a reduction in resource use
- Development of ownership, personal and social responsibility for the Institute and its environment
- Green audit is important criteria of NAAC (National Assessment and Accreditation Council) to get the institution as Grade A, B or C according to the scores assigned during the accreditation.

Target Areas of Green Audit

Green audit forms part of a resource management process. Although they are individual events, the real value of green audit is the fact that they are carried out, at defined intervals, and their

results can illustrate improvement or change over time. Eco-campus concept mainly focuses on the efficient use of energy and water; minimize waste generation or pollution and also economic efficiency.

All these indicators are assessed in the process of "Green Auditing of this educational institute". Eco-campus focuses on the reduction of contribution to emissions, procure a cost effective and secure supply of energy, encourage and enhance energy use conservation, promotes personal action, reduce the institute's energy and water consumption, reduce wastes to landfill, and integrate environmental considerations into all contracts and services considered to have significant environmental impacts. Target areas included in this green auditing are

- Water,
- Energy,
- Waste,
- Green campus
- Environment (Outdoors & Indoors)
- Health and Safety
- Carbon footprint

Auditing for Water Management

Water is a natural resource; all living organisms depend on water. While freely available in many natural environments, in human settlements potable (drinkable) water is less readily available. Groundwater depletion and water contamination are taking place at an alarming rate. Hence it is essential to examine the quality and usage of water in the institute.

Water auditing is conducted for the evaluation of facilities of raw water intake and determining the facilities for water treatment and reuse. The concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water.

Advantage of Water Audit

- Water audits provide decision making tools to utility managers, directors, and operators. i.e., knowing where water is being used in your system allows you to make informed decisions about investing resources such as time, labour and money.
- Water audits allow managers to efficiently reduce water losses in the system.
- Reducing water used at the source may even result in delaying or avoiding capital investments such as a new well, more treatment technology or additional water rights.

- Water audits also identify which water uses are earning revenue for the utility and which water uses are not. Thus, System personnel can increase revenue by institute ensuring all appropriate uses are being accurately measured and billed. This leads to more financial capacity in the water system, reduced cost per customer and better management of the water resource.
- Creating awareness among water users i.e., customers can see and understand that the utility is taking proactive steps to manage wasted water and save for the future.
- It is an effective educational and public relations tool for the water system.

Auditing for Energy Management

Energy conservation is an important aspect of campus sustainability which is also linked with carbon foot print of the campus. Energy auditing deals with the conservation and methods to reduce its consumption related to environmental degradation. It is therefore essential that any environmentally responsible institution examine its energy use practices.

Auditing for Waste Management

Human activities create waste, and it is the way these wastes are handled, stored, collected and disposed of, which can pose risks to the environment and to public health. Pollution from waste is aesthetically unpleasing and results in large amounts of litter in our communities which can cause health problems. Solid waste can be divided into three categories as bio-degradable, non-biodegradable and hazardous waste. Bio-degradable wastes include food wastes, canteen waste, wastes from toilets etc. Non-biodegradable wastes include what is usually thrown away in homes and schools such as plastic, tins and glass bottles etc. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals, acids and petrol. Unscientific management of these wastes such as dumping in pits or burning them may cause harmful discharge of contaminants into soil and water supplies, and produce greenhouse gases contributing to global climate change respectively. Special attention should be given to the handling and management of hazardous waste generated in the institute. Bio-degradable waste can be effectively utilized for energy generation purposes through anaerobic digestion or can be converted to fertilizer by composting technology. Non-biodegradable waste can be utilized through recycling and reuse. Thus the minimization of solid waste is essential to a sustainable institute. The auditor diagnoses the prevailing waste disposal policies and suggests the best way to combat the problems.

Auditing for Green Campus Management

Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities. In one year, a single mature tree will absorb up to 48 pounds of carbon dioxide from the atmosphere, and release it as oxygen. The amount of oxygen released by the trees of the campus is good for the people in the campus. So while you are busy studying and working on earning those good grades, all the trees in campus are also working hard to make the air cleaner for you.

Auditing for Carbon Footprint

Burning of fossil fuels (such as petrol) has an impact on the environment through the emission of greenhouse gases into the atmosphere. The most common greenhouse gases are carbon dioxide, water vapour, methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the most prominent greenhouse gas, comprising 402 ppm of the Earth's atmosphere. The release of carbon dioxide gas into the Earth's atmosphere through human activities is commonly known as carbon emissions. Vehicular emission is the main source of carbon emission in the campus, hence to assess the method of transportation that is practiced in the institute is important.

Methodology for Green Audit

Methodology Adopted for Green Audit

The methodology adopted for this audit has following step process comprising of

Data Collection

In preliminary data collection phase, exhaustive data collection was performed using different tools such as observation, survey communicating with responsible persons and measurements.

Following steps were taken for data collection:

The team went to each department, centres, Library, canteen etc.

Data about the general information was collected by observation and interview.

The power consumption of appliances was recorded by taking an average value in some cases.

Data Analysis

Detailed analysis of data collected include calculation of energy consumption, analysis of latest electricity bill of the campus, understanding the tariff plan provided by Himachal Pradesh Electricity Board. Data related to water usages were also analyzed using appropriate methodology.

Recommendation

On the basis of results of data analysis and observations, some steps for reducing power and water consumption were recommended. Proper treatments for waste were also suggested. Use of fossil fuels has to be reduced for the sake of community health.

The above target areas particular to the institute was evaluated through questionnaire circulated among the students for data collection. Five categories of questionnaires were distributed.

Onsite Visit

Two-days site visit was conducted by the Green Audit Team of Eco Laboratory on 28 and 29 December 2021. The key focus of the visit was on assessing the status of the green cover of the Institution, their waste management practices and energy conservation strategies etc. The sample collection was carried out during the visits to assess the quality of environment. The samples air, noise, drinking water and indoor environment were taken from College campus. The sample collection, preservation, and analysis were done in the scientific manner as prescribed by the standard procedures.

Focus Group Discussion

The Focus Group discussions were held with the Club members, staff members and the management focusing various aspects of Green Audit. The discussion was focused on identifying the attitudes and awareness towards environmental issues at the institutional and local level.

Energy, waste management and Carbon foot print analysis Survey

With the help of teachers and students, the audit team has assessed the energy consumption pattern and waste generation, disposal and treatment facilities of the institute. The monitoring was conducted with a detailed questionnaire survey method.

Process for Environmental Audit

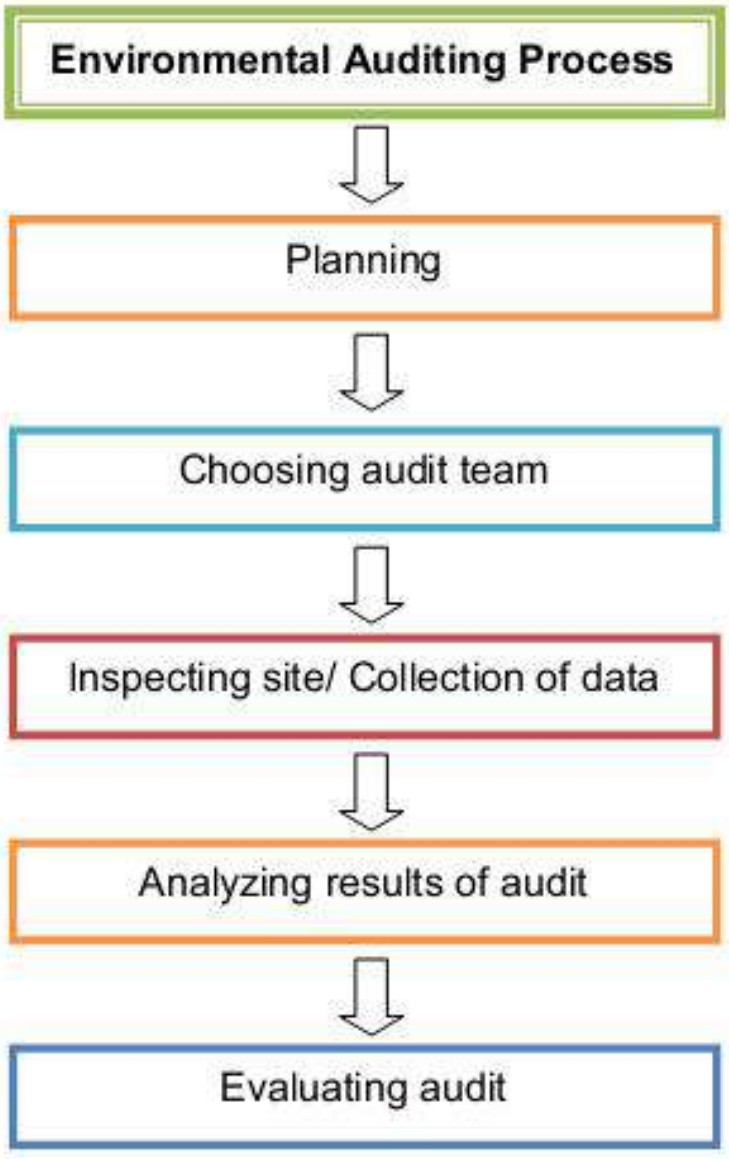


Fig. 3: Process adopted for Environmental Audit

Auditing for Water Resource Management

Auditing for Water Resource Management

Fig. 4: Process adopted for Auditing of Water Resource Management

Source of Water

The institute is getting all required water requirement from Municipal corporation of Chandigarh.

Baseline of Water Consumption

- In India, the design of water supply systems has been done using certain standards. Currently the standard being used is NBC, 2016. This specifies a consideration of use of the following:
- For communities with a population of between 20,000 to 100,000 @ 100 to 135liters per head per day (Max. 135 lpcd has been considered).
- Persons working in normal working hours i.e. Staff @ 45 liters per head per day
- Visitors in the institute @ 15 liters per head per day

The details of the residents living in Campus (Day and Night) are as per Table3.

Table 3: Nos. of Campus residents in the Institute

Sl. No	Particulars	Nos
1	Nos. of Hostlers Students	165
2	No of Staff	5
Total Residents Population		**170**

The details of Persons coming in Day time are as per Table 4.

Table 4: Nos. of Day Time persons in the Institute

Sl. No	Particulars	Nos
1	Nos. of Non-Hostlers Students in Campus	3700
2	No of Staff working in campus	138
3	No of Daily Visitors	30
Total Daytime population		**3868**

Thus total maximum permissible water Consumption as per Standards laid as per NBC, 2016 is given in Table 5.

Table 5: Total permissible water Consumption as per Standards laid as per NBC, 2016

Sl. No.	Particulars (Per day)	Nos.	Maximum water consumption per Person per day (Liters)	Total Maximum water consumption Liters per Day
1	Nos. of full time residents in College Campus	170	135	22,950
2	Nos. of Day time persons (Students and staff)	3838	45	1,72,710
3	No. of Visitors	30	15	450
	Grand Total			**1,96,110**

An attempt was made as per NBC, 2016 to understand the demand of water supply and waste water generated.

Actual Water Demand = 1,96,110 liters per day.

Waste Water Generation = 80% water consumption= 1,56,888 liters per day.

The source of water requirement is municipal supply water The wastewater generated as 3,73,800 liters per day is being discharged into municipal drainage.

Management & Conservation of Water Resources

The institute has taken initiatives for management & conservation of water resources as use of sensor based water taps in some blocks.

Water meter has been installed at an appropriate place to regulate and monitor direct water supply in college.

Water Meter

Recommendations

The institute has no sewage treatment facility, hence recommended to install sewage and effluent treatment plants to treat the daily wastewater generated based on zero liquid discharge so that water resource conservation and efficient management could be done at institute level.

Rainwater Harvesting

Rainwater harvesting is the accumulation and deposition of rainwater for reuse on-site, rather than allowing it to run off. collected from roofs, and in many places the water collected is redirected to a deep pit (well, shaft, or borehole), a reservoir with percolation. Its uses include water for gardens, livestock, irrigation domestic use with proper treatment etc. The harvested water can also be used as drinking water, longer-term storage and for other purposes such as groundwater recharge.

Rainwater harvesting provides an independent water supply during regional water restrictions and in developed countries is often used to supplement the main supply. It provides water when there is a drought, can help mitigate flooding of low-lying areas, and reduces demand on wells which may enable groundwater levels to be sustained. It also helps in the availability of potable water as rainwater is substantially free of salinity and other salts.

Application of rainwater harvesting in urban water system provides a substantial benefit for both water supply and waste water subsystems by reducing the need for clean water in water distribution system, less generated storm water in sewer system, as well as a reduction in storm water runoff polluting freshwater bodies. Supplying rainwater that has gone through

preliminary filtration measures for non-potable water uses, such as toilet flushing, irrigation, and laundry, may be a significant part of a sustainable water management strategy.

Rain Water Harvesting System adopted by College

Fig. 5: Overview of Rain Water Harvesting System in College Campus

Every Rain Water Harvesting system has a collection pit covered with pucca sheds by cemented and concrete as rain water storage. Total five rain water collection pits are in the college campus.

Recommendations

- The institute does not have waste water treatment facility for waste water generated from laboratories, canteen, hostel kitchen, toilets, bathrooms and office rooms.
- The waste water from laboratories, canteen, hostel kitchen, toilets, bathrooms and office rooms is going to municipal sewerage system.
- Lacking of water consumption monitoring system in the campus.
- Automatic switching system is not installed for pump sets used for overhead tank filling.
- Lacking of Flushing and dual plumbing line systems to save the water resources.
- Separate STP and ETP plants need to be installed for water resource conservation and management.
- More Rain Water Harvesting System need to be installed at each Building/ Block wise.
- Quality of water in terms of fresh water supply and domestic and effluent discharges need to check periodically by NABL and MoEF&CC approved laboratory.

Auditing for Waste Management

Auditing for Waste Management

Pollution from waste is aesthetically unpleasing and results in large amounts of litter in our communities which can cause health problems. Plastic bags and discarded ropes and strings can be very dangerous to birds and other animals. This indicator addresses waste production and disposal, plastic waste, paper waste, food waste, and recycling. Solid waste can be divided into two categories: general waste and hazardous waste. General wastes include what is usually thrown away in homes and schools such as garbage, paper, tins and glass bottles. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals and petrol. Unscientific landfills may contain harmful contaminants that leach into soil and water supplies, and produce greenhouse gases contributing to global climate change. Furthermore, solid waste often includes wasted material resources that could otherwise be channeled into better service through recycling, repair, and reuse. Thus the minimization of solid waste is essential to a sustainable institute. The auditor diagnoses the prevailing waste disposal policies and suggests the best way to combat the problems. It is therefore essential that any environmentally responsible institution examine its waste processing practices.

Quantity of Waste Generated

The wastes generated in the college is segregated on daily basis as wet and dry waste in green and blue coloured dustbins respectively, installed at different places, however no data could be provided by the Institute regarding the quantity of waste (Biodegradable, Non-biodegradable and E Waste) generated in the Institute.

Generation of Solid Waste

Table 6: Generation of Solid Waste

Sl. No.	Particulars (Per Day)	Nos.	Rate of solid waste generation (kg per person per day)	Total solid waste generation (kg/day)
1	Nos. of full time residents in College Campus	170	0.4	60
2	Nos. of Day time persons (Students and staff)	3838	0.2	768
3	No. of Visitors	30	0.2	6
	Grand Total			**842**

Disposal of Waste generated

(A)Biodegradable Canteen waste

Wet waste, leaves and other wastes being biodegradable in nature is converted to nutrient rich compost by eco-friendly method of composting. The institute practices different composting strategies such as

- Pit composting,
- In-vessel composting and
- Vermi-composting.

The compost is utilized by the Garden Committee in the extensive College lawns which helps in luxuriant growth of plants besides reducing our reliance on purchase of compost from outside sources. This compost is also sold in college and profits earned are used for the maintenance of composting units.

Pit Composting

In vessel composting

Fig. 6: Vermicomposting

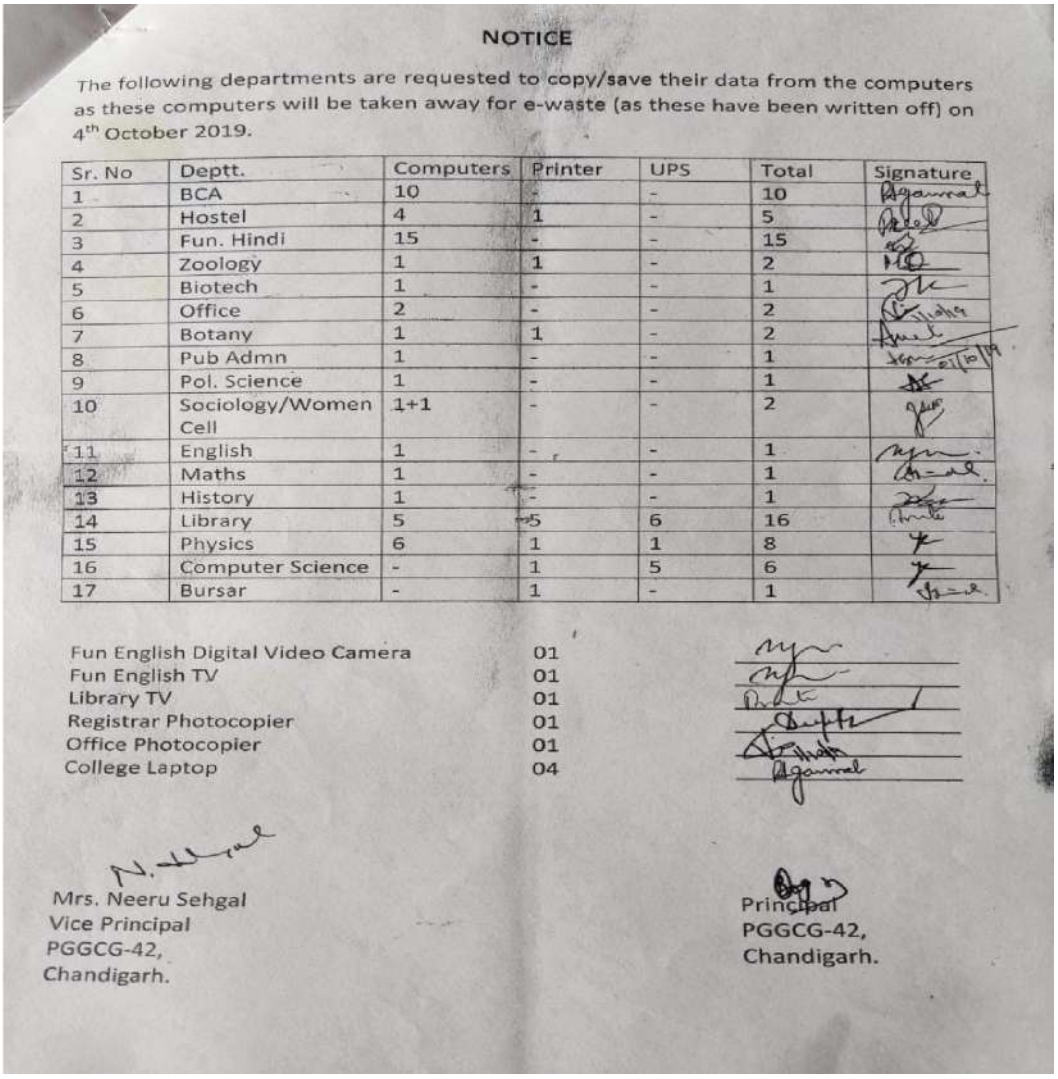
(B)Non-biodegradable

This type of waste including metals, bottles, plastics, cans, broken glass wares, tins and other discarded material like cardboard, waste paper, packaging cartons etc., are sold to authorized vendors through annual auction.

Incinerators for disposal of Sanitary napkins in women rest rooms and Autoclaves in labs for disposal of media after practical work in Bio labs.

(C)E-Waste

E-waste of the college is managed as per the guidelines issued by the Department of Information Technology (DIT), Chandigarh Administration which is associated with the disposal of obsolete IT and electronic equipment. The college disposes off e-waste generated in the college at regular intervals of time.



NOTICE

The following departments are requested to copy/save their data from the computers as these computers will be taken away for e-waste (as these have been written off) on 4th October 2019.

Sr. No	Deptt.	Computers	Printer	UPS	Total	Signature
1	BCA	10	-	-	10	
2	Hostel	4	1	-	5	
3	Fun. Hindi	15	-	-	15	
4	Zoology	1	1	-	2	
5	Biotech	1	-	-	1	
6	Office	2	-	-	2	
7	Botany	1	1	-	2	
8	Pub Admn	1	-	-	1	
9	Pol. Science	1	-	-	1	
10	Sociology/Women Cell	1+1	-	-	2	
11	English	1	-	-	1	
12	Maths	1	-	-	1	
13	History	1	-	-	1	
14	Library	5	5	6	16	
15	Physics	6	1	1	8	
16	Computer Science	-	1	5	6	
17	Bursar	-	1	-	1	

Fun English Digital Video Camera	01
Fun English TV	01
Library TV	01
Registrar Photocopier	01
Office Photocopier	01
College Laptop	04

Mrs. Neeru Sehgal
Vice Principal
PGGCG-42,
Chandigarh.

Principal
PGGCG-42,
Chandigarh.

Fig. 7: E-waste disposal notice (2019)

Authorities are advised to dispose the E Waste to only Government authorized Venders only and keep proper accounting.

(D) Plastic Waste

The college authorities make constant efforts towards segregation and appropriate disposal of plastic waste. The usage of single use plastic products in canteen has been banned /prohibited by College. Students are also made aware about the harmful effects of plastic products and are motivated not to use plastic cups, bottles and spoons.

A campaign 'International Plastic Bag Free day' was launched on 3rd July 2021with an aim to eliminate the use of plastic bags. Our college has also adopted this ideology and has become part of this noble cause. Several activities have been conducted in the college campus as an initiative to spread awareness about harms of using plastic as a part of this campaign. The activities conducted include **Pledge ceremony, Awareness Talk, Slogan Writing, Poster Making and Rally- 'Say No to Plastic Drastic'.**

Solid Waste Management System

No specific data could be provided by the Institute regarding the quantity of solid wastes generated in the campus however the solid waste is collected by Municipal council and segregated other wastes are being sold to authorized vendors.

Recommendations

- Proper waste segregation and management by recycle and reuse of waste with zero discharge can be adopted to manage resources and prevent environmental degradation.
- Waste bins in the class rooms, veranda, canteen and campus are inadequate.
- The institute should have proper communication with the local body for regular collection of solid waste from the campus.
- Bio degradable waste can also be managed in-house by use of mechanical composter and manure generated can be utilized in gardening purposes within the Institute.
- Implementation of sustainable projects to attain set environmental goals is not in place.

Auditing for Environmental Management

Auditing of Environmental Management

As part of green audit of campus, we carried out the environmental monitoring of campus including Illumination and Ventilation of the class room. It was observed that Illumination and Ventilation is adequate considering natural light.

a) Outdoor Environment

Air Quality Index (AQI)

Air Quality Index (AQI) transforms complex air quality data of criteria pollutants into a single number (index value), with nomenclature and colour. AQI was launched on 17 October 2014 in India to disseminate information on air quality in an easily understandable form for the general public. AQI has six categories of air quality which are defined as Good, Satisfactory, Moderately Polluted, Poor, Very Poor and Severe. AQI is considered as 'One Number- One Colour-One Description' for the common man to judge the air quality within his vicinity. The formulation of the index was an initiative under ***Swachh Bharat Mission (cleanliness Mission)***, based on the recommendations of IIT Kanpur and the Expert Group formed in this regard. The earlier measuring index in this regard was limited to three indicators, while the current measurement index had been expanded with five additional parameters. The measurement of AQI is based on following pollutants, namely

- Particulate Matter (size less than 10 µm) or (PM_{10}),
- Particulate Matter (size less than 2.5 µm) or ($PM_{2.5}$),
- Nitrogen Dioxide (NO_2),
- Sulphur Dioxide (SO_2),
- Carbon Monoxide (CO),
- Ozone (O_3) and
- Ammonia (NH_3),

Table 7: AQI Index values and their associated health impacts

AQI	Associated Health Impacts
Good (0–50)	Minimal Impact
Satisfactory (51–100)	May cause minor breathing discomfort to sensitive people.
Moderately polluted (101–200)	May cause breathing discomfort to people with lung disease such as asthma, and discomfort to people with heart disease, children and older adults.
Poor (201–300)	May cause breathing discomfort to people on prolonged exposure, and discomfort to people with heart disease

Very Poor (301–400)	May cause respiratory illness to the people on prolonged exposure. Effect may be more pronounced in people with lung and heart diseases.
Severe (401-500)	May cause respiratory impact even on healthy people, and serious health impacts on people with lung/heart disease. The health impacts may be experienced even during light physical activity.

Methodology of AQI

The ambient air quality has been assessed through scientifically designed ambient air quality monitoring network. The monitoring network was designed based on the following considerations:

- Meteorological conditions
- Topography
- Likely impacts and sensitive receptors

Ambient air quality monitoring network was established as per CPCB guidelines in triangular method @120-degree orientation of three sampling locations. Ambient air quality monitoring was done on 24 hourly bases at each of identified air quality locations simultaneously for a day on 03-04 December 2021.

Parameters & Methods of Air Quality Monitoring

Test methods for determining Various Air Quality Parameters are described in **Table 6**as

Table 8: Test methods for determination of Air Quality Parameters

S. No.	Test Parameter	Test Method
1.	Particulate Matter (PM_{10})	IS:5182 (P-23) 2006 RA 2017
2.	Particulate Matter ($PM_{2.5}$)	Lab SOP EL/SOP/AAQ/01
3.	Sulphur Dioxide (SO_2)	IS:5182 (P-2) 2001 RA 2017
4.	Nitrogen Dioxide (NO_2)	IS:5182 (P-6) 2006 RA 2017
5.	Ammonia (NH_3)	Lab SOP EL/SOP/AAQ/02
6.	Ozone (O_3)	IS:5182 (P-9):2006 RA 2014
7.	Carbon Monoxide (CO)	IS 5182 Part-10:1999, RA 2014

Sampling Procedure

Particulate samples for PM_{10} were collected on Whatman glass fiber filters using respirable dust sampler (AAS 217NL, Ecotech) whereas samples for $PM_{2.5}$ were collected on Whatman Quartz filter papers (47 mm diameter) using fine particulate sampler (AAS 127Mini, Ecotech). During sampling a laminar flow was maintained as 16.7 liters per min (1.0 m^3 per hr) for $PM_{2.5}$ and 1.13 m^3 per minute for PM_{10}. The air sampling was done on 24 hourly basis at a nominal sampling height of 3 meter at each location. Gaseous sampling was done using Thermoelectrically cooled Gas sampler (AAS 109TE, Ecotech) whereas CO was collected in tedlar bag for the analysis by NDIR CO Analyzer (APMA-370, Horiba) and Benzene was collected in activated carbon absorber tubes for GC analysis.

Construction of Air Quality Index (AQI)

- Based on the measured ambient air concentrations, corresponding standards and likely health impact (known as health breakpoints), a sub-index is calculated for each of the pollutants.
- A sub-index is a linear function of concentration e.g. the sub-index for $PM_{2.5}$ will be
  - 51 at concentration 31 µg/m^3,
  - 100 at concentration 60 µg/m^3, and
  - 75 at concentration of 45 µg/m^3
- The formula for calculating a sub-index is as follows:

Sub Index for a pollutant = Upper limit of the previous AQI category to which the pollutant's current reading would have fallen **+**[(current reading **–** upper limit of the previous reading category of the pollutant)***** (width or interval of the AQI category for the current level of reading **/** width or interval of the current reading category of the pollutant)]

Eg. Sub-index for $PM_{2.5}$

If concentration is 150 µg/m3, the sub index would be = 300+[(150-120)*100/130] = 323

If concentration is 45 µg/m3, the sub index would be = 30+[(45-30)*50/30] = 75

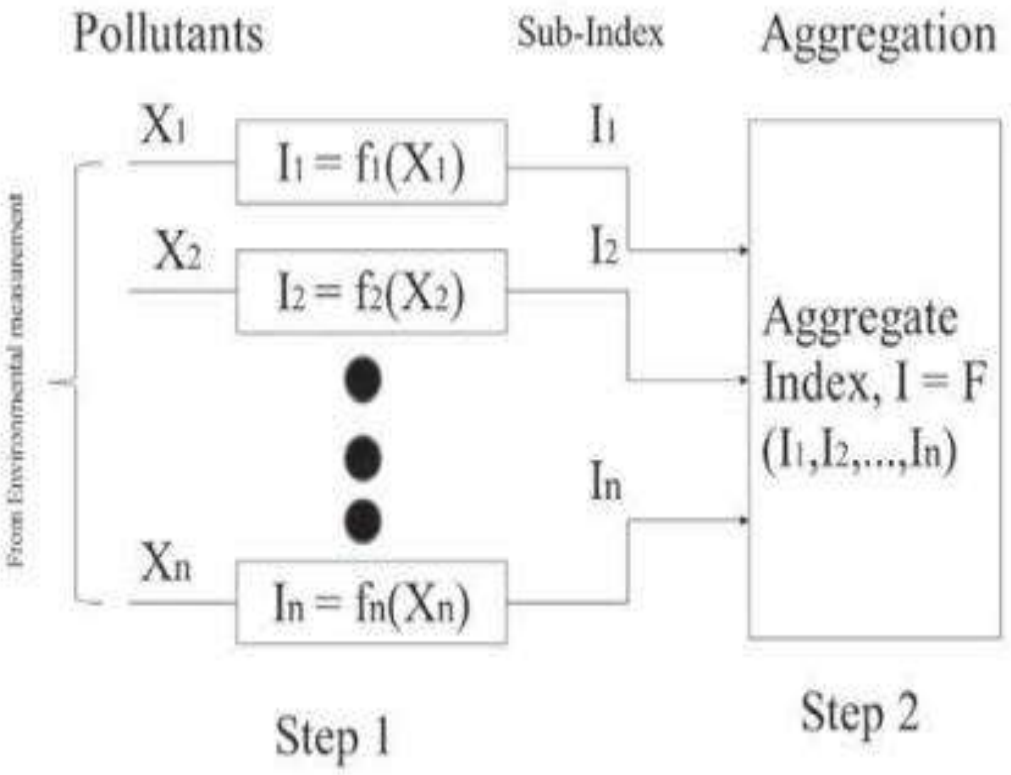


Fig. 8: Index and Sub-index of Pollutants

- Primarily two steps are involved in formulating an AQI: (i) formation of sub-indices (for each pollutant) and (ii) aggregation of sub-indices to get an overall AQI.
- Formation of sub-indices (I1, I2,...., In) for n pollutant variables (X1, X2...., Xn) is carried out using sub-index functions that are based on air quality standards and health effects. Mathematically;

  I = f(Xi), i=1, 2,...,n [Eq. 1]

- Each sub-index represents a relationship between pollutant concentrations and health effect as the functional relationship between sub-index value (Ii) and pollutant concentrations (Xi).
- Aggregation of sub-indices, Ii is carried out with some mathematical function (described below) to obtain the overall index (I), referred to as AQI.

  I = F(I1, I2, ...,In) [Eq. 2]

- The aggregation function usually is a summation or multiplication operation or simply a maximum operator.

Sub-indices (Step 1)

- Sub-index function represents the relationship between pollutant concentration Xi and corresponding sub index Ii. It is an attempt to reflect environmental consequences as the concentration of specific pollutant changes. It may take a variety of forms such as linear, non-linear and segmented linear. Typically, the I-X relationship is represented as follows:

  $I = aX + ß$ [Eq. 3]

  Where, a =slope of the line, ß = intercept at X=0

- The general equation for the sub-index (Ii) for a given pollutant concentration (Cp); as based on 'linear segmented principle' is calculated as:

  $Ii = [\{(IHI-ILO)/(BHI-BLO)\}*(Cp-BLO)]+ILO$ [Eq. 4]

  Where,

  BHI = Breakpoint concentration greater or equal to given concentration.

  BLO = Breakpoint concentration smaller or equal to given concentration.

  IHI =AQI value corresponding to BHI

  ILO = AQI value corresponding to BLO

  Ip = Pollutant concentration

Aggregation of Sub-indices (Step 2)

- Once the sub-indices are formed, they are combined or aggregated in a simple additive form or weighted additive form:

Weighted Additive Form

- $I = \text{Aggregated Index} = \sum WiIi \quad (\text{For } i= 1, \ldots..,n)$ [Eq. 5]

  where,

  $\sum Wi = 1$

  Ii = sub-index for pollutant i

  n = number of pollutant variables

  Wi = weightage of the pollutant

Root-Sum-Power Form (non-linear aggregation form)

- I = Aggregated Index = [∑Iip](1/p) [Eq. 6]

  where,

  p is the positive real number >1

Root-Mean-Square Form

- I = Aggregated Index = {1/k (I12+I22+…… + Ik2)}0.5 [Eq. 7]
- Finally; AQI = Max (Ip) (where; p= 1,2,…..,n; denotes n pollutants)
- The AQI values and corresponding ambient concentrations (health breakpoints) for the identified eight pollutants are as follows:

Table 9: AQI Category, Pollutants and Health Breakpoints

AQI Category (Range)	Categories for various readings of pollutant based on health breakpoints/health impacts						
	PM_{10}	$PM_{2.5}$	NO_2	O_3	CO	SO_2	NH_3
	24-hr	24-hr	24-hr	8-hr	8-hr	24-hr	24-hr
Good (0-50)	0-50	0-30	0-40	0-50	0-1.0	0-40	0-200
Satisfactory (51-100)	51-100	31-60	41-80	51-100	1.1-2.0	41-80	201-400
Moderately polluted (101-200)	101-250	61-90	81-180	101-168	2.1- 10	81-380	401-800
Poor (201-300)	251-350	91-120	181-280	169-208	10-17	381-800	801-1200
Very poor (301-400)	351-430	121-250	281-400	209-748*	17-34	801-1600	1200-1800
Severe (401-500)	430 +	250+	400+	748+*	34+	1600+	1800+

***One hourly monitoring (for mathematical calculations only)**

Calculator for Air Quality Index (AQI)

- For manual monitoring stations, an AQI calculator is developed by CPCB wherein data can be fed manually to get AQI value.
- The excel sheet for calculating AQI, as uploaded by CPCB

Interpretation of Air Quality Index (AQI)

- The worst sub-index reflects overall AQI

  For instance, if the sub index of $PM_{2.5}$ =75, SO_2 = 63, NO_2 =38 then the AQI will be 75 which is the same as the value of the sub index of $PM_{2.5}$.

- The Sub-indices for individual pollutants at a monitoring location are calculated using
  - ✓ 24-hourly average concentration value (8-hourly in case of CO and O_3)
  - ✓ Health breakpoint concentration range (e.g. AQI at 6 am on a day will incorporate data from 6am on previous day to the current day).
  - ✓ AQI is calculated by eight pollutants however, overall AQI can be calculated with available data for minimum three pollutants out of which one should necessarily be either $PM_{2.5}$ or PM_{10}.
  - ✓ Minimum of 16 hours' data is considered necessary for calculating sub index
  - ✓ AQI index values can vary depending on the time of the day.
  - ✓ AQI reflects the status of the worst pollutant in that city. i.e. higher reading in one city can be due to high concentration of PM whereas in some other city it may be due to SO_2.
  - ✓ If one pollutant out of eight is in the "poor" category, then AQI will be in the "poor" category.

For manual monitoring stations, data were fed manually in AQI calculator developed by CPCB to get AQI value. The AQI calculation has been depicted as

Table 10: Air Quality Index (AQI) Calculator

Air Quality Index (AQI) Calculator					
Date	**03-12-2021**	**INPUT**	**Station**	**NSIT**	
Pollutants	**Duration**	**Conc. in µg/m3 (except CO)**	**Sub-Index**	**Check**	**AQI**
PM_{10}	24-hr avg	90.0	90	1	**90**
$PM_{2.5}$	24-hr avg	50.3	84	1	
SO_2	24-hr avg	12.0	15	1	
NO_2	24-hr avg	26.7	33	1	

CO	max 8-hr	0.65	33	1	
O_3	max 8-hr	19.7	20	1	
NH_3	24-hr avg	26.3	7	1	
Concentrations of minimum three pollutants are required; one of them should be PM10 or $PM_{2.5}$. The check displays "1" when a non-zero value is entered					

Interpretation of Air Quality Index (AQI)

Table 11: Indicators & Categories of Air Quality Index

Good (0–50)
Satisfactory (51–100)
Moderately polluted (101–200)
Poor (201–300)
Very Poor (301–400)
Severe (401-500)

AQI Result

Table 12: Test Results of Air Quality Index

Air Quality Index	Air Quality Status
90	**Satisfactory (51–100)**

The Air Quality Index (AQI) is observed as 90 that indicate the ambient air quality is Satisfactory at College campus and safe for human health.

Test Results of Ambient Air Quality

Eco Laboratories & Consultants Pvt. Ltd.
CIN : U74140PB2011PTC034739

TC-7477

TEST REPORT

ULR No. : TC747721000007536F		**Test Report No. :**	EL041221RA001
Type of Sample : Ambient Air Quality		**Date of Reporting :**	10/12/2021
Customer	Post Graduate Government College for Girls Sector-42, Chandigarh	**Work Order No. & Date**	EL/PGGCG/TEL/2706 Dt.: 01/12/2021
		Customer reference No. (If any)	NA
Sampling Protocol	IS:5182 and CPCB Air Manual Volume-I (NAAQMS/36/2012-13) / CPCBNAAQS-2009	**Mode of Collection of Sample**	Sampling by laboratory
Date of Sampling	03/12/2021 To 04/12/2021	**Date of Receipt of Sample**	04/12/2021
Sampling Location	Near Main Gate	**Period of Analysis**	04/12/2021 To 10/12/2021
Testing Protocol	IS:5182 and CPCB Air Manual Volume-I (NAAQMS/36/2012-13) / CPCBNAAQS-2009	**Environmental Conditions**	Partially cloudy weather
Testing Location	On Site & Permanent Facility		

RESULTS

I-Chemical Testing

1. Atmospheric Pollution (Ambient Air)

S.No.	Test Parameter	Unit	Result	Standard	Method
1	Respirable Suspended Particulate Matter (as PM10)	µg/m³	92	100	IS: 5182 (Part-23)
2	Particulate Matter (as PM2.5)	µg/m³	53	60	Lab SOP: EL/SOP/AAQ/01, Issue No. 03, Jan 01
3	Sulphur Dioxide (as SO2)	µg/m³	13	80	IS: 5182 (Part-2)
4	Nitrogen Dioxide (as NO2)	µg/m³	28	80	IS: 5182 (Part-6)
5	Ammonia (as NH3)	µg/m³	27	400	Lab SOP: EL/SOP/AAQ/02, Issue No. -03, Jan 01
6	Ozone (as O3)	µg/m³	20	180	IS: 5182 (Part-9)
7	Carbon Monoxide (as CO) ,	mg/m³	0.71	04	IS: 5182 (Part-10), NDIR Method
8	Lead (as Pb)	µg/m³	BDL (DL 0.04)	01	IS: 5182 (Part-22)
9	Arsenic (as As)	ng/m³	BDL (DL 1.0)	06	Lab SOP: EL/SOP/AAQ/04, Issue No. -03, Jan 01
10	Nickel (as Ni)	ng/m³	BDL (DL 10.0)	20	Lab SOP: EL/SOP/AAQ/04, Issue No. -03, Jan 01
11	Benzo-a-Pyrene (as B(a)P), Particulate Phase Only	ng/m³	BDL (DL 1.0)	01	IS: 5182 (Part-12)

Remarks : NA

OTHER INFORMATION
Abbreviation : ULR: Unique Lab Report, BDL: Below Detection Level, NA: Not Applicable
Terms & Conditions : Please refer terms and conditions on backside of Test Report (Page-1)

End of Report

Checked by QA

Umesh Kumar
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Eco Laboratories & Consultants Pvt. Ltd.

CIN : U74140PB2011PTC034739

TEST REPORT

ULR No. : NA		**Test Report No. :**	EL041221RA001/A
Type of Sample : Ambient Air Quality		**Date of Reporting :**	10/12/2021
Customer	Post Graduate Government College for Girls Sector-42, Chandigarh	**Work Order No. & Date**	EL/PGGCG/TEL/2706 Dt.: 01/12/2021
		Customer reference No. (If any)	NA
Sampling Protocol	IS:5182 and CPCB Air Manual Volume-I (NAAQMS/36/2012-13) / CPCBNAAQS-2009	**Mode of Collection of Sample**	Sampling by laboratory
Date of Sampling	03/12/2021 To 04/12/2021	**Date of Receipt of Sample**	04/12/2021
Sampling Location	Near Main Gate	**Period of Analysis**	04/12/2021 To 10/12/2021
Testing Protocol	IS:5182 and CPCB Air Manual Volume-I (NAAQMS/36/2012-13) / CPCBNAAQS-2009	**Environmental Conditions**	Partially cloudy weather
Testing Location	On Site & Permanent Facility		

RESULTS

I-Chemical Testing

1. Atmospheric Pollution (Ambient Air)

S.No.	Test Parameter	Unit	Result	Standard	Method
1	Benzene (as C6H6)	µg/m³	BDL (DL 5.0)	05	IS: 5182 (Part-11)

Remarks : This test report is the part of Test Report No.EL041221RA001

OTHER INFORMATION

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CIN : U74140PB2011PTC034739

restoring eco balance...

TC-7477

TEST REPORT

ULR No. :	TC747721000007537F	**Test Report No. :**	EL041221RA002
Type of Sample :	Ambient Air Quality	**Date of Reporting :**	10/12/2021
Customer	Post Graduate Government College for Girls Sector-42, Chandigarh	**Work Order No. & Date**	EL/PGGCG/TEL/2706 Dt.: 01/12/2021
		Customer reference No. (If any)	NA
Sampling Protocol	IS:5182 and CPCB Air Manual Volume-I (NAAQMS/36/2012-13) / CPCBNAAQS-2009	**Mode of Collection of Sample**	Sampling by laboratory
Date of Sampling	03/12/2021 To 04/12/2021	**Date of Receipt of Sample**	04/12/2021
Sampling Location	Near Hostel	**Period of Analysis**	04/12/2021 To 10/12/2021
Testing Protocol	IS:5182 and CPCB Air Manual Volume-I (NAAQMS/36/2012-13) / CPCBNAAQS-2009	**Environmental Conditions**	Partially cloudy weather
Testing Location	On Site & Permanent Facility		

RESULTS

I-Chemical Testing

1. Atmospheric Pollution (Ambient Air)

S.No.	Test Parameter	Unit	Result	Standard	Method
1	Respirable Suspended Particulate Matter (as PM10)	µg/m³	88	100	IS: 5182 (Part-23)
2	Particulate Matter (as PM2.5)	µg/m³	48	60	Lab SOP: EL/SOP/AAQ/01, Issue No. 03, Jan 01
3	Sulphur Dioxide (as SO2)	µg/m³	11	80	IS: 5182 (Part-2)
4	Nitrogen Dioxide (as NO2)	µg/m³	25	80	IS: 5182 (Part-6)
5	Ammonia (as NH3)	µg/m³	26	400	Lab SOP: EL/SOP/AAQ/02, Issue No. -03, Jan 01
6	Ozone (as O3)	µg/m³	19	180	IS: 5182 (Part-9)
7	Carbon Monoxide (as CO) ,	mg/m³	0.60	04	IS: 5182 (Part-10), NDIR Method
8	Lead (as Pb)	µg/m³	BDL (DL 0.04)	01	IS: 5182 (Part-22)
9	Arsenic (as As)	ng/m³	BDL (DL 1.0)	06	Lab SOP: EL/SOP/AAQ/04, Issue No. -03, Jan 01
10	Nickel (as Ni)	ng/m³	BDL (DL 10.0)	20	Lab SOP: EL/SOP/AAQ/04, Issue No. -03, Jan 01
11	Benzo-a-Pyrene (as B(a)P), Particulate Phase Only	ng/m³	BDL (DL 1.0)	01	IS: 5182 (Part-12)

Remarks : NA

OTHER INFORMATION

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Terms & Conditions : Please refer terms and conditions on backside of Test Report (Page-1)

End of Report

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Eco Laboratories & Consultants Pvt. Ltd.

CIN : U74140PB2011PTC034739

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TEST REPORT

ULR No. : NA		**Test Report No. :**	EL041221RA002/A
Type of Sample : Ambient Air Quality		**Date of Reporting :**	10/12/2021
Customer	Post Graduate Government College for Girls Sector-42, Chandigarh	**Work Order No. & Date**	EL/PGGCG/TEL/2706 Dt.: 01/12/2021
		Customer reference No. (If any)	NA
Sampling Protocol	IS:5182 and CPCB Air Manual Volume-I (NAAQMS/36/2012-13) / CPCBNAAQS-2009	**Mode of Collection of Sample**	Sampling by laboratory
Date of Sampling	03/12/2021 To 04/12/2021	**Date of Receipt of Sample**	04/12/2021
Sampling Location	Near Hostel	**Period of Analysis**	04/12/2021 To 10/12/2021
Testing Protocol	IS:5182 and CPCB Air Manual Volume-I (NAAQMS/36/2012-13) / CPCBNAAQS-2009	**Environmental Conditions**	Partially cloudy weather
Testing Location	On Site & Permanent Facility		

RESULTS

I-Chemical Testing

1. Atmospheric Pollution (Ambient Air)

S.No.	Test Parameter	Unit	Result	Standard	Method
1	Benzene (as C6H6)	µg/m³	BDL (DL 5.0)	05	IS: 5182 (Part-11)

Remarks : This test report is the part of Test Report No.EL041221RA002

OTHER INFORMATION

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CIN : U74140PB2011PTC034739

TC-7477

TEST REPORT

ULR No. :	TC747721000007538F	**Test Report No. :**	EL041221RA003
Type of Sample :	Ambient Air Quality	**Date of Reporting :**	10/12/2021
Customer	Post Graduate Government College for Girls Sector-42, Chandigarh	**Work Order No. & Date**	EL/PGGCG/TEL/2706 Dt.: 01/12/2021
		Customer reference No. (If any)	NA
Sampling Protocol	IS:5182 and CPCB Air Manual Volume-I (NAAQMS/36/2012-13) / CPCBNAAQS-2009	**Mode of Collection of Sample**	Sampling by laboratory
Date of Sampling	03/12/2021 To 04/12/2021	**Date of Receipt of Sample**	04/12/2021
Sampling Location	Near IT Block	**Period of Analysis**	04/12/2021 To 10/12/2021
Testing Protocol	IS:5182 and CPCB Air Manual Volume-I (NAAQMS/36/2012-13) / CPCBNAAQS-2009	**Environmental Conditions**	Partially cloudy weather
Testing Location	On Site & Permanent Facility		

RESULTS

I-Chemical Testing

1. Atmospheric Pollution (Ambient Air)

S.No.	Test Parameter	Unit	Result	Standard	Method
1	Respirable Suspended Particulate Matter (as PM10)	µg/m³	90	100	IS: 5182 (Part-23)
2	Particulate Matter (as PM2.5)	µg/m³	50	60	Lab SOP: EL/SOP/AAQ/01, Issue No. 03, Jan 01
3	Sulphur Dioxide (as SO2)	µg/m³	12	80	IS: 5182 (Part-2)
4	Nitrogen Dioxide (as NO2)	µg/m³	27	80	IS: 5182 (Part-6)
5	Ammonia (as NH3)	µg/m³	26	400	Lab SOP: EL/SOP/AAQ/02, Issue No. -03, Jan 01
6	Ozone (as O3)	µg/m³	20	180	IS: 5182 (Part-9)
7	Carbon Monoxide (as CO) ,	mg/m³	0.65	04	IS: 5182 (Part-10), NDIR Method
8	Lead (as Pb)	µg/m³	BDL (DL 0.04)	01	IS: 5182 (Part-22)
9	Arsenic (as As)	ng/m³	BDL (DL 1.0)	06	Lab SOP: EL/SOP/AAQ/04, Issue No. -03, Jan 01
10	Nickel (as Ni)	ng/m³	BDL (DL 10.0)	20	Lab SOP: EL/SOP/AAQ/04, Issue No. -03, Jan 01
11	Benzo-a-Pyrene (as B(a)P), Particulate Phase Only	ng/m³	BDL (DL 1.0)	01	IS: 5182 (Part-12)

Remarks : NA

OTHER INFORMATION

Abbreviation : ULR: Unique Lab Report, BDL: Below Detection Level, NA: Not Applicable

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End of Report

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CIN : U74140PB2011PTC034739

TEST REPORT

ULR No. : NA		Test Report No. :	EL041221RA003/A
Type of Sample : Ambient Air Quality		Date of Reporting :	10/12/2021
Customer	Post Graduate Government College for Girls Sector-42, Chandigarh	Work Order No. & Date	EL/PGGCG/TEL/2706 Dt.: 01/12/2021
		Customer reference No. (If any)	NA
Sampling Protocol	IS:5182 and CPCB Air Manual Volume-I (NAAQMS/36/2012-13) / CPCBNAAQS-2009	Mode of Collection of Sample	Sampling by laboratory
Date of Sampling	03/12/2021 To 04/12/2021	Date of Receipt of Sample	04/12/2021
Sampling Location	Near IT Block	Period of Analysis	04/12/2021 To 10/12/2021
Testing Protocol	IS:5182 and CPCB Air Manual Volume-I (NAAQMS/36/2012-13) / CPCBNAAQS-2009	Environmental Conditions	Partially cloudy weather
Testing Location	On Site & Permanent Facility		

RESULTS

I-Chemical Testing

1. Atmospheric Pollution (Ambient Air)

S.No.	Test Parameter	Unit	Result	Standard	Method
1	Benzene (as C6H6)	µg/m³	BDL (DL 5.0)	05	IS: 5182 (Part-11)

Remarks : This test report is the part of Test Report No.EL041221RA003

OTHER INFORMATION
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Fig. 9: Test Reports for Ambient Air Quality in College Campus

b) Indoor Environment

Indoor environment was monitored for visual comfort, thermal comfort, ventilation and noise levels in each College campus blocks.

Visual and Thermal Comfort

Visual comfort was monitored using Lux monitor and thermal comfort was monitored by Heat stress analyzer for temperature and humidity levels.

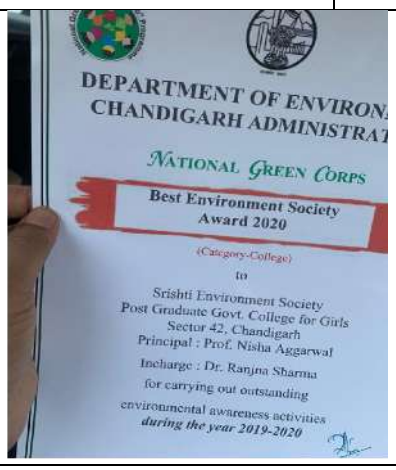
Fig. 10: Photographic view of Indoor Environmental Monitoring

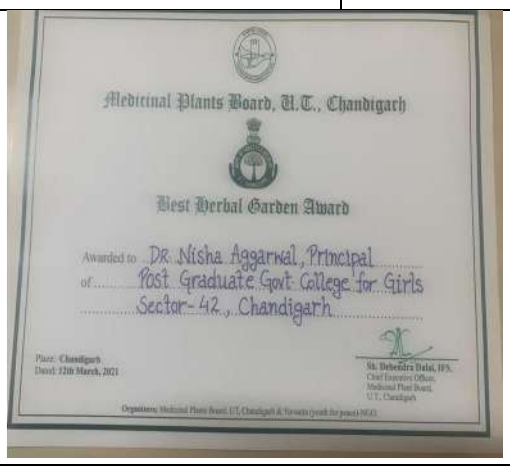
Indoor environment in respect to visual comfort, thermal comfort, noise levels and ventilation was found to be satisfactory in each block of College campus.

Environmental Management

Environmental Awards

Name of the Department	Award/Recognition	Awarding Bodies	Number of students benefitted
'SRISHTI'- The Environment Society	Best Environment Society Award June 2020 and 2021	Department of Environment, Chandigarh Administration, Chandigarh.	203
Dept. of Environment Studies	Best Herbal Garden Award in march 2021	Medicinal/Herbal Board, Chandigarh Administration, Chandigarh	345
Dept. of Environment Studies	Certificate of Appreciation for participation in largest Plantation Drive in higher education institutions.	MGNRE, Ministry of Education, Govt. of India	135
Dept. of Environment Studies	Certificate of Appreciation for Commendable and selfless services in Swachh Action Plan initiative of MGNRE - Phase-1	MGNRE, Ministry of Education, Govt. of India	210





Ecofriendly Initiatives

- **Sensor based Energy Conservation -** Sensor based Water taps in Rest Rooms is another step towards conservation of water.
- S**olar Power Plant** with 200 kWp capacity and with the provision of 800 SPV.
- **Use of LED Bulbs and Energy Efficient Equipment-** The Institution has adopted a healthy alternate source of energy in the entire campus including the hostel. All old electrical fittings have been replaced with energy efficient LED tube lights. Old computer screens have been replaced with LCD monitors to reduce energy consumption. Though LED/CFL are a little more expensive, they can last up to five times longer than regular light bulbs and are very bright, so the need to turn on lights is reduced.
- **Battery operated Vehicle-** Two battery operated Activa (e-bikes) have been purchased by the college which are used by college staff for in campus patrolling and nearby official movements. The use of battery powered vehicles is a step towards a cleaner and greener environment.
- **Signages -** Signages have been put up on every switch board to encourage the students to switch off lights, fans before leaving the class in order to save electricity consumption.
- **Carbon Neutrality** - From 2014 onwards total 2130.232 Megawatts of solar energy was generated from the grid solar power plant located in the Institution. Use of other alternate sources of energy (LED light) etc. is equal to the metric of tons of carbon dioxide emission reduction.
- **College Building Plan-** All blocks in the college building are well ventilated, having glass windows in every room to maximise natural light and air. Students and staff are encouraged to make maximum use of natural light and shade of trees wherever possible in order to save energy.
- **Pedestrian friendly pathways:** There are several pedestrian friendly pathways built in the college campus. The presence of these pathways creates a safe environment in college where pedestrians can walk comfortably.
- **Ban on use of plastic:** The college authorities make constant efforts towards segregation and appropriate disposal of plastic waste. The usage of plastic carry bags and single use plastic products in the canteen has been prohibited by the college authorities. Students are also regularly made aware about the harmful effects of plastic products and are motivated not to use plastic cups, bottles and spoons.
- **Landscaping with trees and plants:** In an effort to increase the area of green cover, the college campus has been beautifully landscaped with 9 lush green gardens and a greenhouse.
- **Shift from Paper to paperless institution:** E-Campus Solution Software for online admissions, Society's activities record, Fee collection /refund, Examinations, Evaluations, Assignments and student attendance.

Social Responsibilities

3.26 Major Activities during the year in the sphere of extension activities and Institutional Social Responsibility

a. Blood Donation Camp in collaborations with NGO'S, Campaigns against female foeticide, pulse polio (NSS) and

b. Youth Adalat, Self Defence, One Billion Rising Campaign, Tree Plantation, Swachhta Bharat Internship

c. Anti-Corruption & Vigilance week

d. National Unity week

e. Awareness Rallies are conducted every year on World Aids Day, World No Tobacco Day and Sadbhavana Day.

f. Holding of Workshops and extra classes for grooming students for entrance exams, NET exam and job market.

g. Holding of workshops and capacity building programmes for skill enhancement of non-teaching staff under the aegis of RUSA.

h. Participation in Project Helping Hand, Project Nanhi Jaan

i. Regular Water Testing to ensure safe drinking water.

Other Social Awareness Programs

a. Continuation of **Project Uday** where our NSS students teach the under privileged children from slums.

b. Awareness Drive about the ***Right of Education Act***.

c. The ***Health and Education Status Survey*** was conducted in the slum area of village Kajheri.

d. ***"Rashtriya Ekta Saptah"*** was celebrated in the campus and in the village.

e. Rally about the ***"Eradication of dengue problem"*** in the village.

f. Awareness Rally about ***"Beti Bacho Beti Parhao"*** in the college campus and in nearby villages also.

g. ***"Tarksheel Mela"*** for the eradication of social evils is organized every year in the village.

h. ***Cleanliness drive*** *was conducted in the college campus and village Kajheri under "Swachh Bharat Abhiyan".*

i. ***Volunteers participated in ' Run For Unity'*** *at Sukhna lake in order to spread the message of the Rashtriya Ekta Diwas*

j. ***Pledge ceremony to commemorate the great events and sacrifices*** *of revered freedom fighter during the freedom struggle*

k. *Different competition as collage making, slogan writing, poster making, best out waste were organised aduring* ***Swachh Bharat Abhiyan***

l. ***Volunteers visited Pingalwara,*** *the house of destitute to provide help and to know the people who are special in the society.*

m. ***A drive was conducted to clean*** *NEW Lake, sector 42, chnadigarh by Volunteers Along with State bank of India*

n. ***Organ donation awareness drive*** *was organised in college campus along with Regional Organ and Tissue Transplantation Organisation (ROTTO), PGIMER, Chandigarh. 62 students took pledge for organ donation on the spot and others to aware their friends and family.*

o. ***Pulse polio*** *campaign was organised in* ***Kajheri village, sector 52 and sector 42, Chandigarh***

p. ***'SARTHI' Project*** *,volunteers help patients of PGIMER, Chandigarh*

q. *A* ***drive' digital India Cashless India'*** *was organised in campus, in sector 42 and kajheri village*

Gender specific issues are addressed by the curriculum and are effectively transacted to instill awareness on the students through:

- Movies/documentaries portraying gender related issues.
- Discussions on the rights and privileges of women in society in the Youth Adalat held every Friday.
- Zero-tolerance stance on ragging.
- Selection of Gender Champions (Women Cell), their orientation and regular meetings
- Awareness session on PC PNDT Act
- One day workshop on Basics of Gender and Gender Stereotypes
- Screening of movie 'Haule Haule' and "Pink" related to sex selection and discrimination and gender sensitization. This was followed by an interaction session on the issues.
- Awareness and sensitization on Sexual Harassment Act in partnership with Jagori Rural (NGO)
- **One Billion Rising** , a global campaign to end violence against women In partnership with Snjah Jagori (NGO)
- Children's Day celebration on 14th Nov 2018 in the hostel.
- Women Day Celebration 8 th -March -2018 College Auditorium
- Reviving Games for girls (Gulli Danda, Tug of war, Rope , Pithoo, Stapu band other games)

Table 13: Awareness programmes/Training Programmes for Environment Promotion

S. No.	EVENT	ACTIVITIES	DATED
1.	World Environment Day	Online Inter college events like Pamphlets Making and one minute round. Topic: Covid-19 And Environment	5th June 2020
2.	Van Mahotsava	100 Plants Like Triveni , Rudrakhsh , Ficus Krishna, Luxmi Taru, Putranjiva, Chi8naar And Fruit Trees Etc Were Planted	13thjuly 2020
3.	AkshayUrjaDiwas	Inter college Event Items; Poster Making. Slogan Writing. Quiz, Guest Lecture	20th August 2020 20th August 2021
4.	Ozone Protection day	Power point Presentation	16th September 2020
5.	Wildlife Week	National Webinar , Speaker ; Dr. Harjit Singh Dhillon Topic : The relationship between environment and wildlife Visit to Butterfly Park, Sec-26	7th October 2020, 7th October 2021
6.	Flowering Plants Distribution Drive	3000 seasonal flowering plants were distributed.	5th December, 2020
7.	Pollution Prevention Day	On the Spot Slogan Writing Competition.	7th December 2020
8.	National Wetland Conservation Day	International Webinar Topic; Environment Sustainability and Our Role-(Challenges and Solutions)	13th February 2021
9.	Workshop	"Skill Development Training Program on Organic Farming and Gardening Skills"	25th and 26th February, 2021
10.	Earth Day	An Inter college 'Best Out Of Waste' competition	22nd April, 2021
11.	International plastic Bag Free Day	As per suggestions by Ministry of Environment, Forest and Climate Change, New Delhi 'No Plastic Use' campaign \has been conducted in college campus that was initiative of Chandigarh Administration and the Civic Body for making Chandigarh plastic free. Pledge ceremony and Awareness Talk has been organized.	3rd July 2021
12.	Van Mahotsava Divas	A joint effort of Mass Tree plantation by 'Srishti'-The Env. Society and physical education dept. Shade giving and ornamental trees were planted	26th July, 2021
13.	Inter-college Slogan Writing Competition	An online inter college Slogan Writing competition with theme , Less Plastic More Life '	Online entries 3rd to 12th August 2021

	Theme : 'Less Plastic More Life '	has been organized in collaboration with Env. Studies Dept. PGGC-11	
14.	National Nutrition Week (Poshan Abhyan) under the aegis Ministry of Environment, Forest and Climate Change, New Delhi.	National Poshan Week (1-7) has been celebrated by maintaining / Nurturing kitchen garden, herbal garden and fruit garden in college campus under 'Poshan Abhyan'. A 'Talk Walk 'was organized on the "Importance of Self Grown Organic Food'	1-7th September 2021
15.	Green Good Deeds : Eco-Friendly Idols And Eco- Friendly Ways Of Idol Immersion On Ganesh Chaturthi/Durga Puja	Under the Aegis of Ministry of Education, New Delhi to Celebrate AZADI KA AMRUT MAHOTSAVA' INDIA@ 75, An online Awareness Drive was conducted by involving people from all walks of life for switching eco-friendly ways of making idols and their immersions. more than 100 people has been shared their views and DIY mantras via circulated google form . Best 3 entries has been awarded with appreciation certificates.	10th September to 22nd September
16.	Green Consumer Day	National Level Poster Making Competition Theme : Be the solution to plastic pollution was conducted which was sponsored by Department of Environment, Chandigarh Administration, Chandigarh. Event was conducted in two categories ie. School level and College / University level.	28th September to 3rd October
17.	Iconic Week Celebration	A Week Long Activities(video clip , poster making , Tree plantation and webinar) Under the Aegis of Ministry of Education, New Delhi to Celebrate AZADI KA AMRUT MAHOTSAVA INDIA@ 75 has been planned on given themes by Ministry of Environment Forest and Climate Change.	4th October to 10th October 2021
18.	Webinar Theme : Water/Wetland Conservation : Life thrives in wetlands	Webinar Water/Wetland Conservation: Life thrives in wetlands has been organized. Dr. Shakha Sharda Assistant Processor PGGC-11 was invited speaker.	9th October 2021
19.	Workshops on 'Gardening and Landscaping Skill development '	Workshops on Gardening and Landscaping Skill development by Dr. Satish Narula, Co-Founder of NGO named Dr. Green and Organic Farming.	25th February 2021
20.	Workshop on 'Composting and Micro greens '	Workshop on Composting and Micro greens by Mr. Rahul Mahajan Founder of NGO named Organic Sharing	24th February 2021

Display of environment promotions on save energy, save water, switch off lights/fans, No Smoking, food wastage control etc.

Picture: Displayed awareness material on Energy conservation, Ozone layer protection and Air Pollution issues. we keep updating these boards time to time.

Picture: These are the Signboards in college campus, Mess/Canteen and Restrooms for maintain good mannerism and hygiene habits.

Picture: These are displayed on college campus walls for prohibition

Green policy/Environmental policy statement indicating the commitment of the institute towards its environmental performance

The institute is committed towards maintaining a green campus and reducing the environmental impact of its activities through several innovative practices.

1. Separate dustbins (blue and green) have been installed in college campus to ensure proper segregation of dry and wet waste. Wet waste (biodegradable) is composted by using different methods of composting and this compost is used to increase the nutritional quality of soil.
2. The College practices waste water management through rain water recycling and tertiary water usage which helps in efficient management of waste water.
3. The use of battery powered vehicles is also practiced and encouraged in our college as a step towards cleaner and greener environment.
4. The usage of single use plastic products in canteen has been banned /prohibited by College.
5. The College has 200 kWp solar power plant installed in the college. The energy generated with through this solar plan is supplied to the electricity board, Chandigarh. The installation of solar plant has helped the college to effectively use solar energy.

6. Solar Water Heaters have also been installed in the college campus where solar energy is captured to meet the heating needs.
7. The entire campus including hostel has been equipped with LED lamps and LED tube lights. This helps to reduce energy consumption
8. Sensor based and push pillar cock water taps have also been installed in washrooms to save water.

Management of plastic wastes

The college authorities make constant efforts towards segregation and appropriate disposal of plastic waste. The usage of single use plastic products in canteen has been banned /prohibited by college. Students are also made aware about the harmful effects of plastic products and are motivated not to use plastic cups, bottles and spoons. To keep check on the use of SUP a Nodal Officer was appointed in the college from the staff.

A campaign 'International Plastic Bag Free day' was launched on 3rd July 2021with an aim to eliminate the use of plastic bags. Our college has also adopted this ideology and has become part of this noble cause. Several activities have been conducted in the college campus as an initiative to spread awareness about harms of using plastic as a part of this campaign. The activities conducted include Pledge ceremony, Awareness Talk, Slogan Writing, Poster Making and Rally- 'Say No to Plastic Drastic'.

Auditing for Health and Safety

Auditing for Health and Safety

a) Fire Safety

Fig 11. Fire Safety Measures in College

Fire safety appliances were in place in some departments/Sections however few departments/Sections / floors lacking these systems.

It is recommended to install fire safety measures at each departments/Sections floor wise and building wise. The fire safety measures adopted by institute need to be verified by Directorate of Fire Services.

b) Health Safety

Fig. 12: Health Safety Measures in College Campus

Health safety measures were reported in place as per requirements in each building/block wise in respect to safe and potable drinking water supply with RO systems. Drinking water sample

was tested for the purpose of portability and suitability of water quality. The available water quality was found to be safe for domestic and human consumption. Water test repot as enclosed.

Health community center is operational in campus for primary health checkups and treatments in case of any medical emergency or medical requirements.

To cater to any emergency health situations, the college has one First aid room in hostel. It is equipped with all basic medical equipment like stethoscope, blood pressure meter, wheelchair, thermometer, oxy-meter, antiseptic creams/liquid, Band-Aids, cold packs etc and some basic medicines. In case of any health crisis faced by any student, faculty or any member of the college, immediate relief is offered by the hostel Nurse and once patient stabilizes, he/she is further referred/shifted to nearest health center/dispensary/hospital as per requirement. These first aids items are purchased through GEM under Health fund. The expired medicines are disposed off in a proper manner.



Fig. 13: Primary Health and First Aid services in College Campus

Facilities for Divyangjan (Differently abled)

Item facilities	Yes/No	Number of beneficiaries
Provision for lift	Yes	2
Ramp/Rails	Yes	4
Brailled Software/facilities	Yes	2
Rest Rooms	Yes	5
Any other similar facility	Yes	2

c) Traffic &Parking Area

Fig. 14: Management of Traffic in College Campus

Designated parking areas are in place sufficient to manage daily traffic fleet in the campus. Designated parking areas help to manage daily traffic movement and to avoid nuisance and accidental risks in the campus.

Test Report of Drinking Water

Eco Laboratories & Consultants Pvt. Ltd.
CIN : U74140PB2011PTC034739
restoring eco balance...

TC-7477

TEST REPORT

ULR No. : TC747721000007531F		**Test Report No. :**	EL031221RW001
Type of Sample : Water (Drinking Water)		**Date of Reporting :**	10/12/2021
Customer	Post Graduate Government College for Girls Sector-42, Chandigarh	**Work Order No. & Date**	EL/PGGCG/TEL/2706 Dt.: 01/12/2021
		Customer reference No. (If any)	NA
Sampling Protocol	IS:3025 (P-1) 1987 RA 2019	**Mode of Collection of Sample**	Sampling by laboratory
Date of Sampling	03/12/2021	**Date of Receipt of Sample**	03/12/2021
Sampling Location	After RO (Canteen Area)	**Testing Location**	Permanent Facility
Testing Protocol	IS 10500:2012 (IInd Revision)	**Period of Analysis**	03/12/2021 To 10/12/2021
Sample Description	Clear Colourless Liquid.		
Packing, Markings, Seal & Qty.	2+1 litre Plastic & 250ml Glass Bottle Marked 'R/03/01'		

RESULTS

I -Chemical Testing

1. Water (Drinking Water)

S.No.	Test Parameter	Unit	Result	Acceptable limit	Permissible limit in absence of alternate source	Test Method
1	Colour	Colour Units	BDL(DL5)	5	15	APHA-23rd Ed-2120B Visual Comparison (Pt Cobalt) Method
2	Odour	-	Agreeable	Agreeable	Agreeable	IS: 3025 (Part-5)
3	pH @ 25°C	-	7.56	6.5-8.5	No relaxation	IS:3025 (Part-11)
4	Turbidity	NTU	BDL(DL0.1)	1	5	IS: 3025 (Part-10)
5	Total Dissolved Solids	mg/l	163	500	2000	IS: 3025 (Part-16)
6	Calcium as Ca	mg/l	34	75	200	IS :3025 (Part-40)
7	Chloride as Cl	mg/l	6.0	250	1000	IS:3025 (Part-32)
8	Copper as Cu	mg/l	BDL(DL0.02)	0.05	1.5	IS: 3025 (Part-42)
9	Fluoride as F	mg/l	0.18	1.0	1.5	IS:3025 (Part-60)
10	Iron as Fe.	mg/l	BDL(DL0.1)	1.0	No relaxation	APHA-23rd Ed -3500Fe-B Phenanthroline Method
11	Magnesium as Mg	mg/l	6.3	30	100	IS: 3025 (Part-46)
12	Nitrate as NO3	mg/l	3.6	45	No relaxation	APHA-23rd Ed-4500 B UV Screening Method
13	Sulphate as SO4.	mg/l	24	200	400	IS:3025 (Part-24) Cl 4.0- Turbidity Method
14	Total alkalinity as CaCO3.	mg/l	126	200	600	IS: 3025 (Part-23)
15	Total hardness as CaCO3	mg/l	112	200	600	IS:3025(P-21)
16	Zinc as Zn	mg/l	BDL(DL0.1)	5	15	APHA-23rd Ed- 3111B A-Ac Flame AAS

Checked by QA

Simranjit Kaur
Authorized Signatory-Biological

Tanu Sharma
Authorized Signatory-Chemical

Format No. F/7.8.2-W-01-18.06.20 Rev 05

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ECO BHAWAN E-207, Industrial Area, Phase VIII-B (Sector-74), Mohali (Punjab) 160071
0172-4616225 9781303109 consulteco@yahoo.com | ecolab@ecoparyavaran.org www.ecoparyavaran.org

TC-7477

ULR No. : TC747721000007531. **Test Report No. :** EL031221RW001

Type of Sample : Water (Drinking Water) **Date of Reporting :** 10/12/2021

16						Method
17	Cyanide as CN	mg/l	BDL(DL0.01)	0.05	No relaxation	APHA-23rd Ed- 4500 E
18	Lead as Pb	mg/l	BDL(DL0.01)	0.01	No relaxation	APHA-23rd Ed-3111C A-Ac Flame AAS Method
19	Total chromium as Cr	mg/l	BDL(DL0.05)	0.05	No relaxation	APHA-23rd Ed-3111B A-Ac Flame AAS Method

II -Biological Testing

1. Water (Drinking Water)

S.No.	Test Parameter	Unit	Result	Acceptable limit	Permissible limit in absence of alternate source	Test Method
1	Total coliform	CFU/100ml	Absent	Absent	-	IS:15185
2	E.coli.	CFU/100ml	Absent	Absent	-	IS:15185

Remarks : NA

OTHER INFORMATION

Abbreviation : ULR: Unique Lab Report, BDL: Below Detection Level, NA: Not Applicable

Terms & Conditions : Please refer terms and conditions on backside of Test Report (Page-1)

End of Report

LABORATORIES & CONSULTANTS PVT. LTD. E-207 1st Floor Phase VIII-B (Sec. 74), Mohali (Pb.)

Checked by QA

Simranjit Kaur
Authorized Signatory-Biological

Tanu Sharma
Authorized Signatory-Chemical

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Fig 15. Test Repots of Drinking Water Quality in College Campus

Auditing for Green Campus Management

Auditing for Green Campus Management

Unfortunately, biodiversity is facing serious threats from habitat loss, pollution, over consumption and invasive species. Species are disappearing at an alarming rate and each loss affects nature's delicate balance and our quality of life. Without this variability in the living world, ecological systems and functions would break down, with detrimental consequences for all forms of life, including human beings. Newly planted and existing trees decrease the amount of carbon dioxide in the atmosphere. Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities.

In one year, a single mature tree will absorb up to 48 pounds of carbon dioxide from the atmosphere, and release it as oxygen. The amount of oxygen that a single tree produces is enough to provide one day's supply of oxygen for people. So while you are busy studying and working on earning those good grades, all the trees on campus are also working hard to make the air cleaner for us. Trees on our campus impact our mental health as well; studies have shown that trees greatly reduce stress, which a huge deal is considering many students are under some amount of stress.

The institute is nestled amidst tall and lush green trees. The green belt development in the campus is vast with following species as

A. Oldest trees
B. Nutritional trees
C. Ornamental trees
D. Medicinal trees
E. Sacred/cultural trees

A. Oldest Trees

Triveni: Banyan, Pipal, Neem (49 years old)

B. Nutritional Trees (Fruit Garden)

S.No.	Common name	Botanical Name	Number
1.	Mango	Mangifera indica	17
2.	Kathal or Jackfruit	Artocarpus lacucha	10
3.	Guava	Psidium guajara	7
4.	Lemon	Citrus x limon	6
5.	Jamun	Syzygiumcuminis	6

6.	Pomegranate or Anaar	Punicagranatum,	5
7.	Lokat	Eriobotrya japonica	5
8.	Pear	Pyrus pyrefoliacuttiva	5
9.	Orange	Citrus aurantium	5
10.	Mausami	Citrus limetta	5
11.	Chikoo	Manilkara zapota	5
12.	Litchi	Litchi chensis	5
13.	Plum	Prunus	5
14.	Ber	Ziziphus mauritiana	3
15.	Mulberry	Morus	5
16.	Banana	Musa acuminata	2
17.	Apple	Malus domestica	1
18.	Date	Phoenix	1

C. Ornamental Trees

S.No	Common name	Botanical Name	Number
1.	Makhan Tree	Sapiumsebiferum	4
2.	AutralianKikkar	Acacia auriculiformis	1
3.	Amaltas	Casia fistula	34
4.	Bottle Brush	Callistemon viminalis	20
5.	Gulmohar	Delonix regia	3
6.	NilliGulmohar	Jacaranda mimosafolia	10
7.	Devil's Tree	Alstoniascholaris	12
8.	Chakrasia	Chukrasiatabularis	20
9.	Samundra Fall	Beringtoniaactangula	3
10.	Bottle Palm	Oreodoxa regia	40
11.	Powder Puff	Calliandra	2
12.	Silver Oak	Grevilliarobusta	5
13.	False Ashoka	Polyathialangifolia	20
14.	Pagoda	Plumeria	15
15.	Yellow Kaner	Nerium oleander	14
16.	Kaner	Nerium indicum	8
17.	Dharek	Melia azedarach	4
18.	Jasmine	Jasminium	1

19.	Ficus	Ficus benjamina	15
20.	Pinwheel flower plant	Tabernaemontanadivaricata	20
21.	Karonda	Carisia carandas	5
22.	Kusum	Scheicheraoleosa	4
23.	Teak	Tectona grandis	5
24.	Chinar	Platanus orientalis	4

Ornamental Climbers/ Creepers

S.No	Common name	Botanical Name	Number
1.	Passion fruit (Rare Plant)	Passiflora edulis	1
2.	Bleeding heart flower	Clerodendrumthomsoniae	2 varieties
3.	Swiss cheese plant	Monstera deliciosa	1
4.	Garlic Vine	Mansoaalliacea	1
5.	Tickey creeper	Ficus Pimula	1
6.	Rangoon Creeper jhumka vine	Combretum indicum	1
7.	Bougganvilla	Bougainvillea	10 varieties

D. Medicinal Trees

S.No.	Common name	Botanical Name	Number
1.	Arjun	Terminalia arjuna	3
2.	Bahera	Terminalia bellerica	2
3.	Neem	Azadirachta indica	8
4.	Sohanjna	Moringa oleifera	4
5.	Amla	Phyllanthus emblica	20
6.	Safeda	Eucalyptus	120
7.	Kachnar	Baohiniavariegata	4
8.	Bael	Aegle marmelos	1
9.	Kikkar	Acacia arabica	4
10.	Shisham	Delbergia sissoo	2
11.	Camphor	Cinnamomum camphora	1
12.	China Rose	Hibiscus rosa	18
13.	Rubber plant	Ficus elastica	3
14.	Chandan/ Sandalwood	Santalum album	10

Recommendations

- Create automatic drip irrigation system during summer holidays.
- Not just celebrating environment day but making it a daily habit.
- Beautify the institute building with maximum use of oxygen generating indoor plants
- Encouraging students and conducting competitions among departments for making students and staff more interested in making the campus green.
- All trees in the campus should be named scientifically with the importance of tree in our life.

Auditing for Energy Management

Auditing for Energy Management

Energy is one of the major inputs for the economic development of any country. The fundamental goal of energy management is to produce goods and provide services with the least cost and least environmental effect. Also it can be said as "the strategy of adjusting and optimizing energy, using system and procedure so as to reduce energy requirements per unit of output while holding constant or reducing total costs of producing the output from these systems". The energy audit is key to a systematic approach for decision making in the area of energy management. It attempts to balance the total energy inputs with its use, and serve to identify all the energy streams in a facility.

a) Electrical Energy

Energy resources utilized by all the departments, support services and the administrative buildings of Govt. PG College for Girls, Chandigarh, include electricity, solar energy and liquid petroleum. Major use of the energy is at office, canteen, hostel and laboratories, for lighting, transportation, cooking and workshop instruments. The institute has installed solar power plant having a capacity of 180 kW. Electricity is also supplied to the University campus by Chandigarh Electricity Board. The communication process for awareness in relation to energy conservation is found inadequate.

- Regular monitoring of equipment's and immediate rectification of any problems.
- Employment of more solar panels and other renewable energy sources.
- Conduct more save energy awareness programs for students and staff.
- Observe a power saving day every year.
- Automatic power switch off systems may be introduced.

Fig. 16: Use of LED Lights in college

b) Fuel Energy

The fuel energy audit determines the approximate use of petrol or diesel by the vehicles inside the College. It also includes the efforts taken by the College to conserve the fuel. The conventional source of fuel for the vehicle is petrol and diesel. Maximum students, teaching and non-teaching staff of College and visitors use two wheelers and four wheeler vehicles. So, the data regarding fuel utilization for students, teaching and non-teaching staff of College and visitor are monitored in the study. For the purpose of the fuel energy audit the entire College campus with infrastructure is divided into groups. With respect to the mentioned classes the survey was carried out regarding the petrol/diesel fuel use in by students, teaching and non-teaching staff and visitors coming with vehicles on the campus.

As the part of fuel energy management and reduction of carbon footprints, the institute has initiated some efforts as introduced electric bike for campus use

Fig. 17: E-vehicle in college campus

c) Solar Energy

The institute has installed solar power plant having a capacity of 200kWp.

Fig 18: Solar Power in College Campus

Percentage of power requirement of the University met by the renewable energy sources
The college has 200kwp solar power plant installed in the college. The Solar Plant generated 266279 kwh of electricity during the year.

Initiatives and Plan for Energy Conservation

Adoption of alternate /renewable source of energy

- **Solar Power Plant**

Solar Power Plant with 200 kWp capacity and with the provision of 800 SPV had been installed and inaugurated on 22nd august 2014 by Union Minister of state for Home Affairs Kiren Rijiju. The solar plant is the joint effort of our institute and Chandigarh administration. It is also a vision project of the Chandigarh Renewable Energy Science & Technology

promotion society. The Solar Plant generated 266279 kWh of electricity during the year which is exported to Grid under net metering arrangement.

- **Use of LED Bulbs and energy efficient equipment**

The institute has adopted healthy alternate source of energy in the college campus including hostel. All old electrical fittings have been replaced by energy efficient LED tube lights. Old Computers screens have also been replaced by LCD monitors to reduce energy consumption.

- **Battery operated Vehicle**

Two battery operated Activa (e-bike) have been purchased by college which are used by college staff for nearby official movements. The use of battery powered vehicles is a step towards cleaner and greener environment.

- **Sensor based and push pillar cock water taps**

Sensor based and push pillar cock water taps for wash basins to save water energy.

Recommendations for Energy Management

- Installation of more solar power stations and adoption of green energy resources for conservation of energy with sustainable development and reduce carbon footprints.
- Isolate the leech Loads from power when not in use.
- Recommend the centralized HVAC system instead of Individual Room Heater and AC.
- Establish Energy Efficiency and Conservation steering committee to take with energy efficiency initiative and management within the building.
- Prepare the POWER CONTROL ROOM to centralized the power system.
- Proper earth mat, & Lighting earthing arrangement for buildings.

Auditing for Carbon Footprint

Auditing for Carbon Footprint

Commutation of stakeholders has an impact on the environment through the emission of greenhouse gases into the atmosphere consequent to burning of fossil fuels (such as petrol and diesel vehicles). The most common greenhouse gases are carbon dioxide, water vapour, methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the most prominent greenhouse gas, comprising 402 ppm of the Earth's atmosphere. The release of carbon dioxide gas into the Earth's atmosphere through human activities is commonly known as carbon emissions.

An important aspect of doing an audit is to be able to measure your impact so that we can determine better ways to manage the impact. In addition to the water, waste, energy and biodiversity audits we can also determine what our carbon footprint is, based on the amount of carbon emissions created. One aspect is to consider the distance and method traveled between home and College every day. It undertakes the measure of bulk of carbon dioxide equivalents exhaled by the organization through which the carbon accounting is done. It is necessary to know how much the organization is contributing towards sustainable development. It is therefore essential that any environmentally responsible institution examine its carbon footprint.

Efforts to Reduce Carbon Footprints

- The college provides facility of common transport for students.
- One mini bus which provides pick and drop facility to students residing in faraway areas.
- Most of students and some employees use cycle to commute.
- Students coming from areas/villages adjoining Chandigarh make use of public transport to reach college.
- The parking area for staff and students is also at the main entrance to avoid pollution.
- Since 2014 total 2130.232 Megawatts of solar energy has been generated that is equivalent to metric of tons of carbon dioxide emission reduction in the air.
- Besides usage of other means of renewable sources by institute is definitely helpful in attaining carbon neutrality.

Recommendations

- Installation of solar panels or solar energy generation devices should be enhanced to reduce the electricity footprint of the campus. Terrace of each building can be utilized to produce electricity from tilt able solar modules.
- The food waste generated from College hostel mess, guest house, canteens and staff quarters should be converted into the biogas which can be further utilized for hostel kitchens.
- The solar battery operated vehicles should be used on the campus to overcome the vehicle footprint.
- The Green computing or E- work is helping the organization to reduce footprint very effectively.
- The awareness should be made among the faculty, students and other employees regarding Clean Development Mechanism (CDM) to reduce the consumption of electricity and natural resources.
- Establish a system of carpooling among the staff to reduce the number of four wheelers coming to the College.
- Establish a more efficient cooking system to save gas.
- Discourage the students using two wheelers for their commutation.

Evaluation of Audit Findings

Evaluation of Audit Findings

Major Audit Observations in General

- Gardens and greenbelt development inside the College premises are found well maintained.
- Use of notice boards and signs are inadequate to reduce over exploitation of natural resources.
- Programs on green initiatives have to be increased.
- Environmental education programs have to be strengthened.
- Rain water harvesting systems, solar power generation, environmental education programs have to be strengthened.
- Establish a purchase policy for environmental friendly materials.
- Students and staff can be permitted to solve local environmental problems.

Water Audit

- The institute does not have waste water treatment for waste water generated from laboratories, canteen, hostel kitchen, toilets, bathrooms and office rooms.
- The waste water from laboratories, canteen and kitchens are not suitably treated to conserve water resource and zero liquid discharge from the college campus.
- Display boards against the misuse of water use are lacking.
- Automatic switching system is not installed for pump sets used for overhead tank filling.
- Lacking of Flushing and dual plumbing line systems to save the water resources.
- Separate STP and ETP plants need to be installed for water resource conservation and management.
- More Rain Water Harvesting System need to be installed at each Building/ Block wise.
- Quality of water in terms of fresh water supply and domestic and effluent discharges need to check periodically by NABL and MoEF&CC approved laboratory.

Waste Audit

- Solid waste management systems established are insufficient.
- Bio degradable waste may also be used for non-conventional Energy Generation or Steam Generation for cooking food/Washing cloths/ Bio gas plant etc.
- Waste bins in the class rooms, veranda, canteen and campus are inadequate.
- Mechanical composting system can be adopted to reduce the load of waste generation.

Energy Audit

- The communication process for awareness and Objectives for reducing energy, water and fuel consumption are inadequate.
- Regular monitoring of equipment's and immediate rectification of any problems with monitoring records.
- Employment of more solar panels and other renewable energy sources.
- Conduct more save energy awareness programs for students and staff.
- Observe a power saving day every year.
- Automatic power switch off systems may be introduced.

Green Campus Audit

- Display boards to all plants identified with scientific name and importance of species are lacking.
- Registry for flora and fauna on the campus is lacking.
- Awareness seminars to be organized on various environmental issues.

Carbon Footprints

- Adequate common transportation facilities should be provided by the institute.
- Encourage the students and staff to use bicycles or battery operated vehicles.

Recommendations

General Recommendations

Water

- Manual water Taps should be replaced with Auto closed water Taps
- Treatment systems for sewage and effluent waste water based on Zero Liquid Discharge (ZLD) to reduce undue pressure on municipal system and to manage water resources and their conservation.
- Drip irrigation for gardens and vegetable cultivation can be initiated.
- Establish water treatment systems to recycle drain water
- Awareness programs on water conservation to be conducted.
- Install display boards to control over exploitation of water.

Waste

- A model solid waste treatment system and Bio Digester plant to be established to reduce undue pressure on municipal system and to manage and convert wastes into valuable resources.
- Practice of waste segregation to be strengthened.

Green Campus

- Create automatic drip irrigation system during summer holidays.
- Not just celebrating environment day but making it a daily habit.
- Beautify the institute building with maximum use of oxygen generating indoor plants
- Encouraging students and Conducting competitions among departments for making the campus green.
- All trees in the campus should be named scientifically with its importance.

Energy

- Isolate the leech Loads from power when not in use.
- Recommend the centralized HVAC system instead of Individual Room Heater and AC.
- Remove the Faulty Appliances Located in the building.
- Installation of more solar power stations and adoption of green energy resources for conservation of energy with sustainable development and reduce carbon footprints.
- Establish Energy Conservation steering committee to take energy efficient initiative and energy management in the campus.

- Prepare the POWER CONTROL ROOM to centralized the power system.
- Proper earth mat/ earthing arrangement for buildings.
- Quantify the energy consumption block-wise and room wise

Energy Conservation Tips

Lighting System

- One of the best energy-saving devices is the light switch. Turn off lights when not required.
- Many automatic devices can help in saving energy used in lighting. Consider employing infrared sensors, motion sensors, automatic timers, dimmers and solar cells wherever applicable, to switch on/off lighting circuits.
- As for as possible use task lighting, which focuses light where it's needed. A reading lamp, for example, lights only reading material rather than the whole room.
- Dirty tube lights and bulbs reflect less light and can absorb 50 percent of the light; dust your tube lights and lamps regularly.
- Fluorescent tube lights and CFLs convert electricity to visible light up to 5 times more efficiently than ordinary bulbs and thus save about 70% of electricity for the same lighting levels.

Room Air Conditioners

- Use ceiling or table fan as first line of defense against summer heat. Ceiling fans, for instance, cost about 30 paisa an hour to operate - much less than air conditioners (Rs.10.00 per hour).
- You can reduce air-conditioning energy use by as much as 40 percent by shading your home's windows and walls. Plant trees and shrubs to keep the day's hottest sun off the house.
- One will use 3 to 5 percent less energy for each degree air conditioner is set above22°C (71.5°F), so set the thermostat of room air conditioner at 25°C (77°F) to provide the most comfort at the least cost.
- Using room ceiling or room fans allows you to set the thermostat higher because the air movement will cool the
- A good air conditioner will cool and dehumidify a room in about 30 minutes, so use a timer and leave the unit off for some time.

- Keep doors to air-conditioned rooms closed as often as possible.
- Clean the air-conditioner filter every month. A dirty air filter reduces airflow and may damage the unit. Clean filters enable the unit to cool down quickly and use less energy.
- If room air conditioner is older and needs repair, it's likely to be very inefficient. It may work out cheaper on life cycle costing to buy a new energy-efficient air conditioner.

Pumps

- Operate pumping near best efficiency point.
- Modify pumping to minimize throttling.
- Adapt to wide load variation with variable speed drives or sequenced control of smaller units.
- Use booster pumps for small loads requiring higher pressures.
- Increase fluid temperature differentials to reduce pumping rates.
- Repair seals and packing to minimize water waste.
- Balance the system to minimize flows and reduce pump power requirements
- Use siphon effect to advantage: don't waste pumping head with a free-fall (gravity) return

Tips for ecofriendly activities can be adopted in campus

- Planting and caring of trees in and around the campus.
- Timely disposal of wastes from the campus.
- Campus is to be declared as plastic free.
- Management has to adopt green protocol
- Distribution of medicinal plant saplings among students

Adoption of Environmental Education Policy

The following environmental education program may be implemented in the institute before the next green auditing

- Training programs in solid waste management, liquid waste management, setting up of medicinal plant nursery, water management, vegetable cultivation, paddy cultivation, tree planting, energy management, landscape management, pollution monitoring methods, and rain water harvesting methods.

- Increase the number of display boards on environmental awareness such as – save water, save electricity, no wastage of food/water, no smoking, switch off light and fan after use, plastic free campus etc.
- Activate the environmental clubs
- Set up model rainwater harvesting system, rainwater pits, vegetable garden, medicinal plant garden, paddy fields etc. for providing proper training to the students.
- Conduct exhibition of recyclable waste products
- Implement chemical treatment system for waste water from the laboratories.

Awareness on Carbon Consumption

Students and Staff members may be made totally aware of pollution caused by use of vehicles. The awareness programs on carbon consumption/ carbon emission at individual as well as social level will help to avoid air and noise pollution in the campus due to vehicles.

Reducing the Carbon Footprints

- Installation of solar panels or solar energy generation devices should be enhanced to reduce the electricity footprint of the campus. Terrace of each building can be utilized to produce electricity from tilt able solar modules.
- The food waste generated from College hostel mess, guest house, canteens and staff quarters should be converted into the biogas which can be further utilized for hostel kitchens.
- The battery operated vehicles should be used on the campus to overcome the vehicle footprint.
- The Green computing or E- work is helping the organization to reduce footprint very effectively.
- The awareness should be made among the faculty, students and other employees regarding Clean Development Mechanism (CDM) to reduce the consumption of electricity and natural resources.

Fig 19: Basic and Fundamental Components of environmental sustainability

Key Recommendations

Following are some of the key recommendation for improving campus environment:

- An environmental policy document has to be prepared with all the recommendations and current practice carried by College.
- A frequent visit should be conducted to ensure that the generated waste is measured, monitored and recorded regularly and information should be made available to administration.
- The College should develop internal procedures to ensure its compliances with environmental legislation and responsibility should be fixed to carry out it in practice.
- The solid waste should be reused or recycled at maximum possible places. The biodegradable waste is generated in more amounts in hostels which should be properly utilized for manure preparation or biogas generation.
- Reuse of glass bottles for storage of chemicals should be encouraged or the bottles should be sent to again suppliers for reuse.
- Installation of sensor based electrification items like fans, lights, etc. can save electricity.

- Installation of more solar panels and rain water harvesting system to every terrace of building will be useful in conserving the natural resources.
- Regular checkups and maintenance of pipes, overhead tanks and plumbing system should be done by engineering section to reduce overflow, leakages and corrosions.
- Science laboratories large amount of water goes waste during the process of making distilled water; the system should have developed to reuse this water for other purposes. The solar distillation unit be installed at the earliest.
- Testing of environmental samples as Ambient air, Noise levels, drinking water, DG emissions and waste and trade effluents on quarterly basis by NABL and MoEF&CC approved laboratory to assess the quality existing environment and associated health hazards.

Preparation of Action Plan

Preparation of Action Plan

There should be Committee formation for energy Audit, Green Audit and Environmental Audit involving Faculties and Students. Policies referring to institute's management and approach's towards the use of resources need to be considered. The institute should have a green policy/environmental policy for its sustainable development. The environmental policy formulated by the management of the institute should be implemented meticulously. The institute should have a policy on awareness raising or training programs (for ground staff or kitchen staff for example) and institute also should have a procurement policy (the Institute's policy for purchasing materials).

Green Audits are exercises which generate considerable quantities of valuable management information. The time and effort and cost involved in this exercise is often considerable and in order to be able to justify this expenditure, it is important to ensure that the findings and recommendations of the audit are considered at the correct level within the organization and that action plans and implementation programs result from the findings. Audit follow up is part of the wider process of continuous improvement. Without follow-up, the audit becomes an isolated event which soon becomes forgotten in the pressures of organizational priorities and the passing of time.

Exit Meeting

The exit meeting was conducted jointly by experts of Eco Laboratories and team members of College. It was a mechanism to provide the management and staff a broad feedback on the preliminary findings of the audit team before completing the audited report. The exit meeting was held in the College on 29th December 2021. Clarification on certain information gathered was sought by the audit team from the management and staff of the College.

Fig. 20: Team of Experts during Green Audit of College Campus

Draft Audit Report

The information gathered by the audit team was consolidated as a draft audit report. This draft report was then circulated to the audit team and those directly concerned with the audit to check the report for accuracy. The draft green audit report was also discussed in the exit meeting.

Final Audit Report

The final audit report is the corrected final document which contains the findings and recommendations of the audit. It will also form one of the bases of future audits because the information it contains informs some of the tests and analyses that need to be performed in the future. Final Audit Report was submitted to the Principal/ Director of the Govt. PG College for Girls, Chandigarh.

Follow Up and Action Plans

Green audits form a part of an on-going process. Innovative green initiatives have to be designed and implemented every year to make the institute environmentally sustainable. Follow up programs of green auditing recommendations should be done meticulously before next audit.

Next Audit

In order to promote continuous improvement, it is recommended to conduct the next green auditing during the year 2023.

Transparency of Green Audit Report

Green audit report is one of the useful means of demonstrating an organization's commitment to openness and transparency. If an organization believes it has nothing to hide from its stakeholders, then it should feel confident enough to make its green audit reports freely available to those who request them. As a basic rule, green audit reports should be made available to all stakeholders.

About Eco Group (Consultant)

ABOUT ECO GROUP

Eco Group is North India's reputed environmental organization Headquartered in Mohali (Chandigarh) that offers consultancy and environmental-related turnkey solutions for overall pollution abatement and sustainable development. We are a professional engineering firm with National level consultancy approved by QCI/ NABET and Environmental and Mechanical testing laboratory approved by MoEF&CC, NABL(ISO/IEC 17025:2017) and state boards.

Eco Group, established in 1998 has designed, engineered and executed more than 1,000 installations of Water, Domestic Sewage and Industrial Effluent Treatment Plants. With the help of our state-of-the-art technologies and apt infrastructure, we are proud to maintain an impeccable quality record, owing to our customer satisfaction levels. These treatment plants operate with the help of trained staff, including Sewage Treatment Plants (STPs), Effluent Treatment Plants (ETPs), Reverse Osmosis Plants (ROs), etc. In the last 20 years, we have undertaken several projects successfully and have created sustainable solutions to environmental issues.

Eco Group has two major business divisions as Eco Paryavaran Engineers & Consultants Pvt. Ltd. and Eco Laboratories & Consultants Pvt. Ltd. The former caters to consultancy and providing engineering solutions for environmental pollution whereas the latter pertains to the analytical and consultancy services in the field of lab studies. Eco Paryavaran is North India's leading supplier of pollution control equipment with world-class infrastructure.

Eco Laboratories is NABL (National Accreditation Board for Testing and Calibration Laboratories) accredited for ISO/IEC 17025:2017, approved by Ministry of Environment, Forest and Climate Change (MoEF&CC) &State Pollution Control Board (SPCBs) in the field of air, noise, wastes, water/wastewater testing including microbiological testing. Eco Laboratories & Consultants Pvt. Ltd. is also Government approved for ISO 9001:2015, ISO 14001 and OHSAS-18001:2007 and Environment Management Services (EMS) accredited by National Accreditation Board for Education and Training (NABET).

Table 14: Special Facility of Eco Group for Environmental Testing & Management

Onsite Environmental Testing

Mobile Testing Laboratory

Noise Dose Monitoring in Work Zone Environment

Noise Dosimeter – SVANTEK SV104IS, Intrinsically Safe

Flue Gas Emissions from Stack/ Source/ Duct

Flue Gas Analyzer – MRU, Optima 7

Calibration of Online CEMS (Emission/ Effluent)

Calibration for Particulate Matter (Emissions) & pH, BOD, COD, TSS (Effluents)

Aerosol Dust in Ambient/ Indoor/ Workzone Environment

(TSI SidePak™ AM520i Real Time Aerosol Sampler for **PM_{10}, $PM_{5.0}$, $PM_{2.5}$, $PM_{1.0}$ and $PM_{0.8}$**- DPM), Intrinsically Safe

Milk Powder Emission Loss Monitoring in Dairy Industry

Quantification of Milk Powder Emission Loss form Milk Dryers/ Fugitive Emissions/ General Leakage

VOCs & Toxic Gases in Ambient/ Indoor/ Workzone Environment

Real Time VOC/Toxic Gas Meter (PID) - TIGER PhoCheck, Ion Science, UK, Intrinsically Safe

Carbon Monoxide (CO) in Ambient/ Indoor/ Work zone Environment

Real Time NDIR CO Monitor - Horiba APMA-370

Validation of Indoor Environment in Hospitals/ Operation Theaters

As per ISO 14664 standard, services are delivered as Air Change/ Ventilation Rate, Air Velocity at filtration unit, Pressure Differential, Validation of HEPA Filters by DOP /POA testing, Temp. and Humidity

Industrial Hygiene & Occupational Health and Safety Study in Work zone Environment

Industrial Hygiene, Ventilation Rate, Heat Stress, Health and Safety Study as per OSHA/ NIOSH/ Indian Factories Act, 1948

Noise & Vibration Monitoring

Sound level meters and octave brands

Biohazard Testing

Air Quality Testing for Bacteria. Yeast & Mould Count

Table 15: Team of Experts for the Study

S. No.	Name of Expert	Role of Expert	ID of Expert
1.	**Dr. Sandeep Garg** (Ph. D. & ME in Env. Sc., BE in Civil)	**Managing Director** ▪ NABL approved authorized signatory ▪ MoEF&CC approved govt. analyst ▪ NABET approved EIA Coordinator & Functional Area Expert ▪ Chairman IWE & Ex-Advisor, GMADA	
2.	**Dr. Rai Singh** (Ph. D. & M. Sc. Env. Sc. P.G. Diploma in Industrial Safety, Health & Env.)	**Dy. General Manager (Technical & Environment)** ▪ MoEF&CC approved Govt. Analyst; ▪ NABL approved authorized signatory ▪ NABET approved Environmental Expert ▪ Worked in CPCB (2001-12) as Research Scientist	
3.	**Dr. Ajay Kumar**	**Chief Technical Officer** **Quality Manager** ▪ NABL approved authorized signatory	
4.	**Ms. Simranjit Kaur** (M.Sc. &M.Phill.; Ph.D. in Solid Waste Management)	**Deputy General Manager – EMS & Biological Lab** **Quality Manager – Analytical Division** ▪ NABL Technical Assessor, ▪ NABL approved authorized signatory ▪ MoEF&CC approved govt. analyst ▪ NABET approved EIA Coordinator & Functional Area Expert	
5.	**Mr. Umesh Kumar** (M. Tech – Nanotech)	**Technical Manager &** **Sr. Laboratory Analyst** (Environment & Chemical) ▪ NABL approved authorized signatory	

Approvals of Eco Laboratory

Approvals of Eco Laboratory

NABET ACCREDITATION CERTIFICATE

Quality Council of India

National Accreditation Board for Education & Training

Certificate of Accreditation

Eco Laboratories and Consultants Pvt Ltd, Mohali

E 207, Phase VIII B, Sector 74, Industrial Area, SAS Nagar, Mohali

*The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –*

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals- opencast only	1	1 (b)	A
2	Metallurgical industries	8	3 (a)	B
3	Cement plants	9	3 (b)	A
4	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	21	5 (f)	A
5	Distilleries	22	5 (g)	A
6	Sugar Industry	25	5 (j)	B
7	Industrial estates/ parks/ complexes/ Areas, export processing zones (EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	31	7 (c)	A
8	Common Effluent Treatment Plants (CETPs)	36	7 (h)	B
9	Building and construction projects	38	8 (a)	B
10	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RA AC minutes dated July 02, 2021 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QO/NABET/ENV/ACO/21/1936 dated Sept 10, 2021. The accreditation needs to be renewed before the expiry date by Eco Laboratories and Consultants Pvt Ltd, Mohali following due process of assessment.

Sr. Director, NABET
Dated: Sept 10, 2021

Certificate No.
NABET/EIA/2023/RA 0211

Valid up to
Dec 17, 2023

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

NABL ACCREDITATION CERTIFICATE

National Accreditation Board for Testing and Calibration Laboratories

NABL

CERTIFICATE OF ACCREDITATION

ECO LABORATORIES AND CONSULTANTS PVT. LTD.

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

ECO GROUP, ECO BHAWAN, E-207, INDUSTRIAL AREA, PHASE VIII-B, (SECTOR 74), MOHALI, PUNJAB, INDIA

in the field of

TESTING

Certificate Number: TC-7477

Issue Date: 01/06/2021 Valid Until: 31/05/2023

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : ECO LABORATORIES AND CONSULTANTS PVT. LTD.

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

MOEF&CC ACCREDITATION CERTIFICATE

रजिस्ट्री सं० डी० एल०-33004/99 REGD. NO. D. L.-33004/99

भारत का राजपत्र
The Gazette of India

असाधारण
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पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 26 फरवरी, 2018

NOTIFICATION

New Delhi, the 26th February, 2018

S.O. 857(E).—In exercise of the powers conferred by clause (b) of sub-section (1) of section 12 and section 13 of the Environment (Protection) Act, 1986 (29 of 1986), read with rule 10 of the Environment (Protection) Rules, 1986, the Central Government hereby makes the following further amendments in the notification of the Government of India in the erstwhile Ministry of Environment and Forests, number S.O. 1174(E), dated the 18th July, 2007, namely: -

In the Table appended to the said notification, -

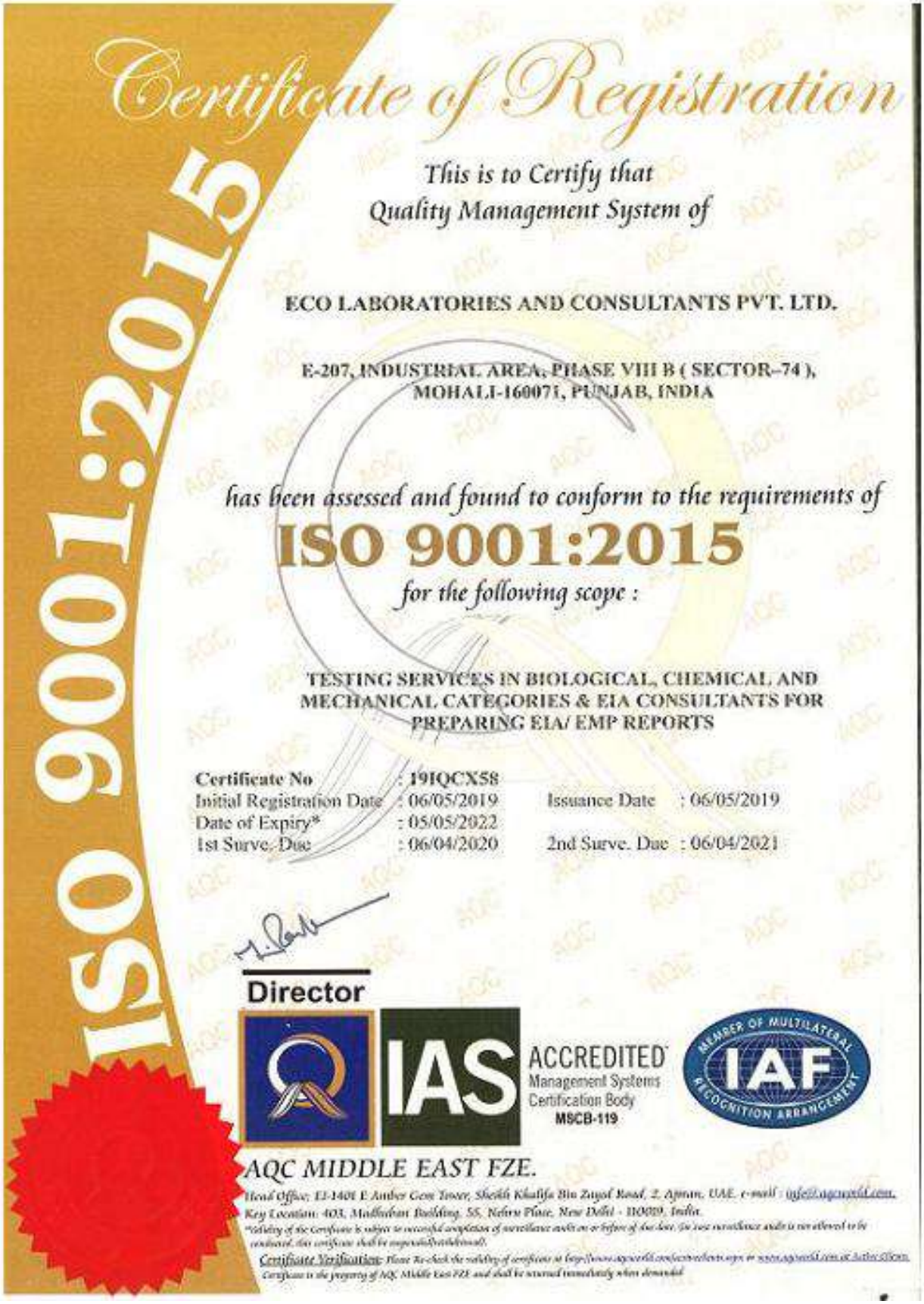
(i) for serial numbers 1,17,24,26,30,39,41,45,81,86,87,93,94,95,96 and 100 the entries relating thereto, the following serial numbers and entries shall be substituted, namely: -

S.No.	Name of the Laboratory	Name of the Govt. Analyst	Recognition with effect from and valid up to
(1)	(2)	(3)	(4)
"1	M/s Mantec Consultants Pvt. Ltd., D-36, Sector-VI, Noida-201301, Uttar Pradesh	(i) Mr. Gaja Nand Mallick (ii) Dr. Vivek Dwivedi (iii) Mr. Sumit Verma	26.02.2018 to 25.02.2023
17	M/s Idma Laboratories Limited	(i) Mr. Ankush Aggarwal	26.02.2018

	391, Industrial Area, Phase-I, Panchkula-160019,Haryana	(ii)Mr. Niranjan Dev Behl (iii) Dr. Rajendra Kumar Jain	to 25.02.2023
24	M/s Newcon Consultants & Laboratories Pvt. Ltd. 8th K.M. Stone, Delhi Meerut Road, Morta (Opp. Manan Dham Mandir), Ghaziabad-201003, Uttar Pradesh	(i) Mr. Pankaj Gupta (ii) Mr. Amit Kumar Singh (iii) Mr. Intekhab Khan	26.02.2018 to 25.02.2023
26	M/s Klean Laboratories & Research Pvt. Ltd. 402, Purushottam Plaza, Opp. Baner Telephone Exchange,Baner Road, Pune-411045, Maharashtra	(i) Mr. Vishwas Waman Kale (ii) Mr. Sanjay Kamalakar Mardikar (iii) Ms. Manjusha Gaikwad	26.02.2018 to 25.02.2023
30	M/s Lawn Enviro Associates, "Lawn House" #184-C, Vengalrao Nagar, Hyderabad-500038, Telangana	(i) Mr. Devireddy Nagarujuna Reddy (ii) Ms. Chevula Anuradha (iii) Ms.Vangani Pallavi	26.02.2018 to 25.02.2023
39	M/s Team Test House. (A Unit of Team Institute of Science & Technology Pvt. Ltd.) G-1-584, RIICO Industrial Area, Sitapura, Jaipur-302022, Rajasthan	(i) Mrs. Kavita Mathur (ii) Mr. Kedar Nath Mukhopadhyay (iii) Mr.Rajesh Maheshwari	26.02.2018 to 25.02.2023
41	M/s Envirochem Research & Test Labs Pvt. Ltd. HIG-79, Sector-E, Aliganj, Lucknow-226024, Uttar Pradesh	(i) Dr. Madan Mohan Agarwal (ii) Sh. Vivek Kumar Gupta (iii) Mrs. Saroj Singh	26.02.2018 to 25.02.2023
45	M/s Mineral Engineering Services 25/XXV, Club Road, Bellary-583103, Karnataka	(i) Mr. M. Sachin Raju (ii) Mr. M.R. Durga Prasad (iii) Mr. A.D. Yashwanth Arun Murthy	26.02.2018 to 25.02.2023
81	M/s Advanced Environmental Testing and Research Lab Pvt. Ltd. 63/1, Kailash Vihar, Near ITO, City Center-II, Gwalior-474011, Madhya Pradesh	(i)Mr. Rajesh Jain (ii)Dr. Dinesh Kumar Uchchariya (iii) Mr. Arvind Kumar Sharma	26.02.2018 to 25.02.2023
86	M/s Care Labs Plot No. 1, 3rd Floor, Sai Sadan Complex, Shiva Ganga Colony, L.B. Nagar, Hyderabad-500074, Telangana	(i) Mr.K. Srinivasa Rao (ii) Ms. Gouthami Gangula (iii) Ms. P. Mamatha	26.02.2018 to 25.02.2023
87	M/s Green Circle Inc. Green Empire, Anupushpam Habitat Centre, Nr. Yash Complex, Above Axix Bank Ltd., Gotri Main Road, Vadodara-390021, Gujarat	(i) Mr. Pradeep Joshi (ii) Mr. Ram Raghav (iii) Ms. Shital Jashvantsinh Parmar	26.02.2018 to 25.02.2023
93	M/s Eco Laboratories & Consultants Pvt. Ltd., E-207, Industrial Area, Phase- VIII B, Sector-74, Mohali-160071, Punjab	(i) Mr. Sandeep Garg (ii) Ms. Simranjit Kaur (iii) Dr. Deepika Thakur	26.02.2018 to 25.02.2023
94	M/s Hubert Enviro Care Systems Pvt. Ltd. No. 18, 92nd Street, Ashok Nagar, Chennai-600083, Tamil Nadu	(i)Dr. J.R. Moses (ii)Dr. Rajkumar Samuel (iii) Mr. A.K. Natarajan	26.02.2018 to 25.02.2023
95	M/s Nawal Analytical Laboratories Plot No. 100, New SIDCO Industrial Estate, Sri Nagar, Hosur-635109, Tamil Nadu	(i) Mr. D.Balakrishnan (ii) Ms. S. Elamathi (iii) Mr. K.B.Krishnamoorthy	26.02.2018 to 25.02.2023

Approved

ISO 9001: 2015 CERTIFICATE



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ISO 9001:2015

This is to Certify that
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ECO LABORATORIES AND CONSULTANTS PVT. LTD.

E-207, INDUSTRIAL AREA, PHASE VIII B (SECTOR–74),
MOHALI-160071, PUNJAB, INDIA

has been assessed and found to conform to the requirements of

ISO 9001:2015

for the following scope :

TESTING SERVICES IN BIOLOGICAL, CHEMICAL AND MECHANICAL CATEGORIES & EIA CONSULTANTS FOR PREPARING EIA/ EMP REPORTS

Certificate No	: 19IQCX58		
Initial Registration Date	: 06/05/2019	Issuance Date	: 06/05/2019
Date of Expiry*	: 05/05/2022		
1st Surve. Due	: 06/04/2020	2nd Surve. Due	: 06/04/2021

Director

IAS ACCREDITED Management Systems Certification Body MSCB-119

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

AQC MIDDLE EAST FZE.

Head Office: EJ-1401 E Amber Gem Tower, Sheikh Khalifa Bin Zayed Road, Z. Ajman, UAE. e-mail : info@aqcworld.com,
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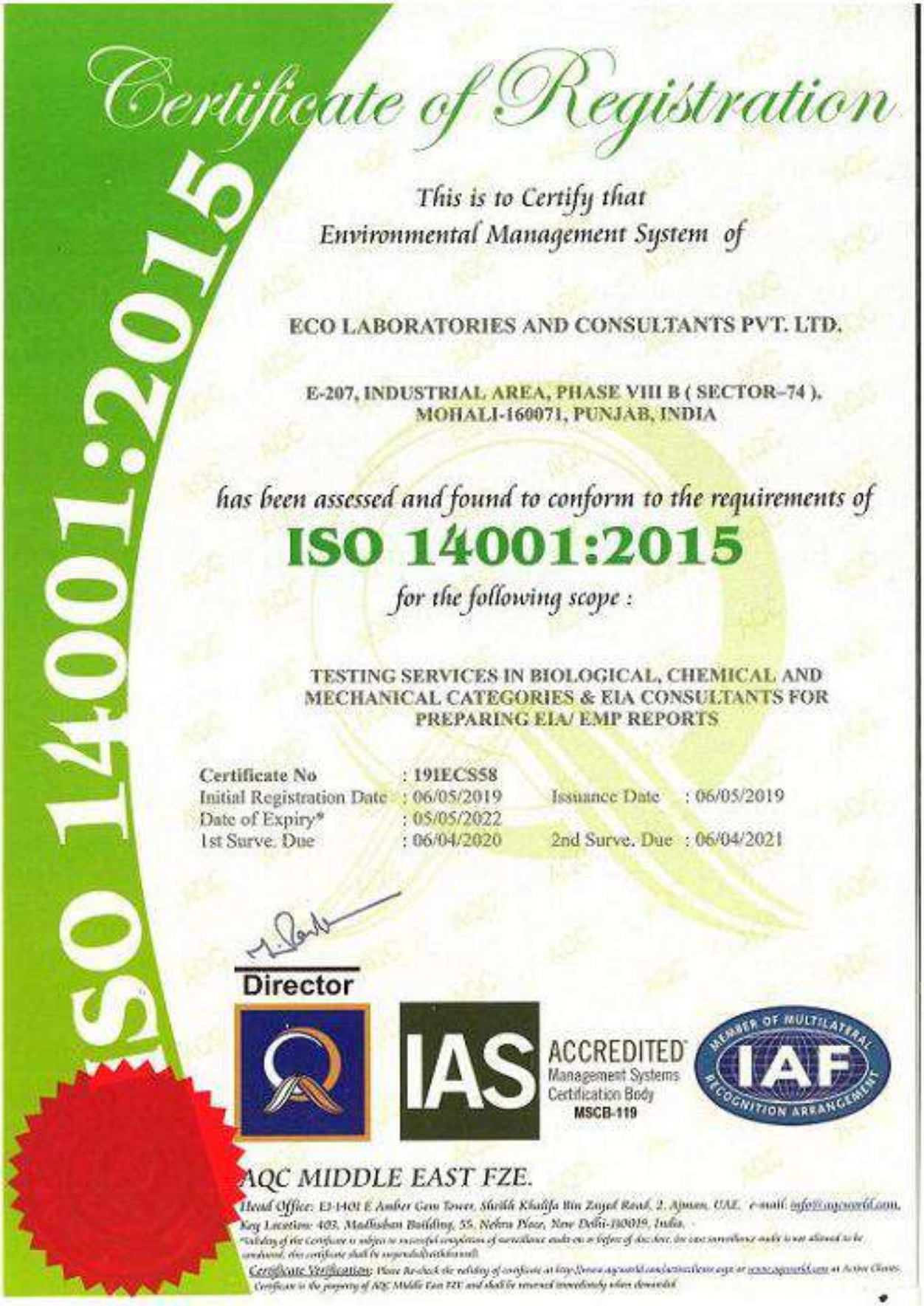

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Head Office: EJ-1401 E Amber Gem Tower, Sheikh Khalifa Bin Zayed Road, 2, Ajman, UAE. e-mail: info@aqcworld.com,
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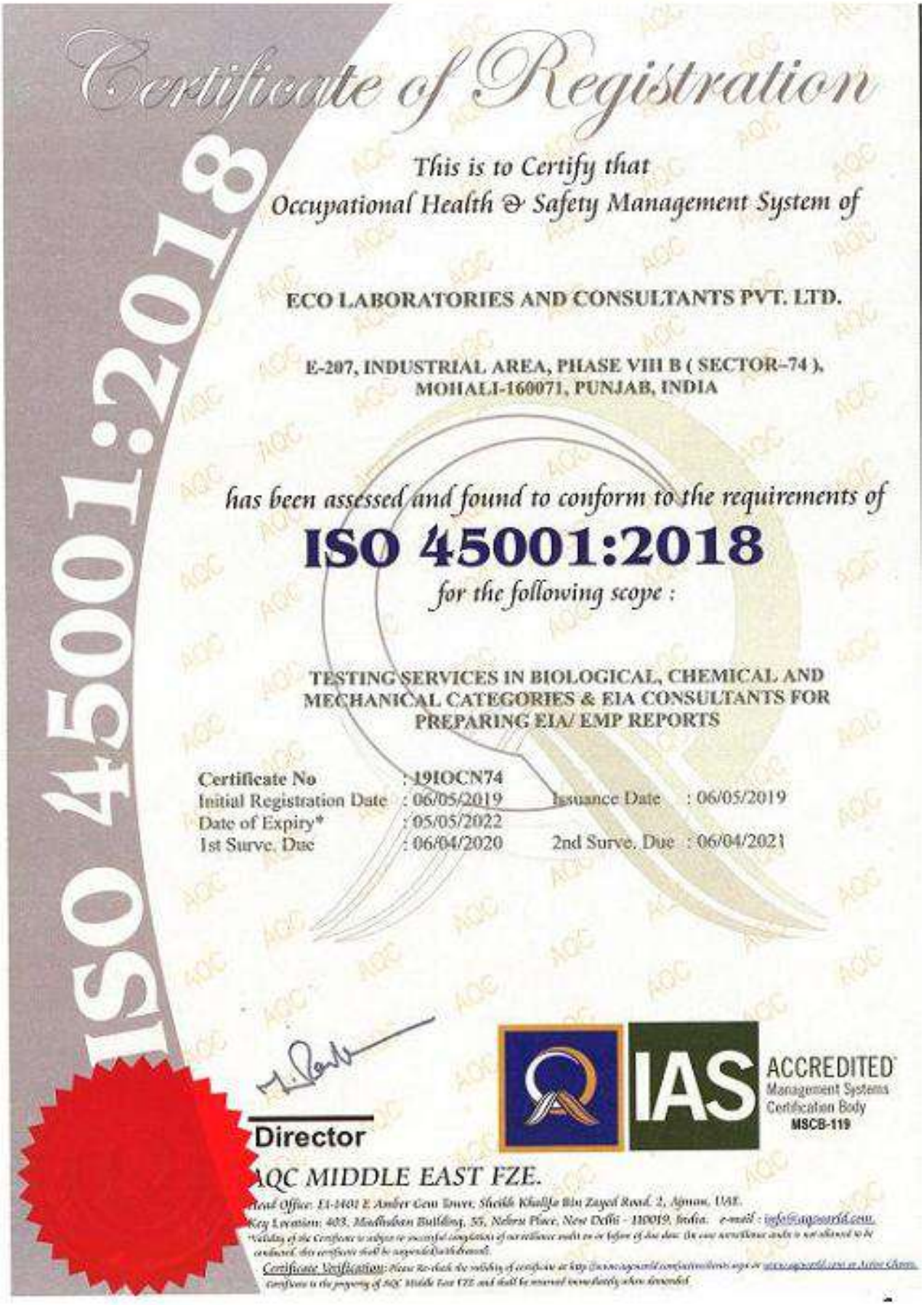

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MOHALI-160071, PUNJAB, INDIA

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Date of Expiry*	: 05/05/2022		
1st Surve. Due	: 06/04/2020	2nd Surve. Due	: 06/04/2021

ISO 45001:2018

Director

IAS ACCREDITED Management Systems Certification Body MSCB-119

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Acknowledgement

Acknowledgement

Eco Laboratories and Consultants are thankful to the Management and the Principal of Govt. PG College for Girls, Chandigarh, for entrusting processes of Green auditing with us.

We thank all the participants of the auditing team especially students, faculty and non-teaching staff who took pain along with us to gather data through survey.

We also thank the office staff who helped us during the document verification.

Prepared By

Dr. Rai Singh
(DGM - Environment)

Approved By

Dr. Sandeep Garg
(Managing Director)

www.ecoparyavaran.org

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