



# ENVIRONMENT AND ENERGY AUDIT

September 2022



▶ Prepared by

**MALNAD GREEN TECH INDUSTRIES, SHIVAMOGGA**

# **ENVIRONMENT AND ENERGY AUDIT**

**Report of**

**J N N College of Engineering  
Shivamogga-Karnataka State**

**September -2022**



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MALNAD GREEN TECH INDUSTRIES, SHIVAMOGGA**

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**ENVIRONMENT AND ENERGY AUDIT CERTIFICATE**

**This is to certify that, green auditing of JNN COLLEGE OF ENGINEERING, SHIMOGA has been carried out successfully from 19-08-2022 to 20-09-2022. All the provided data pertaining to Energy, Water, Waste and Greenery are analyzed and the observations are listed. The suggestions to improve the green campus status are also given in the report.**

**Date: 20-09-2022**

  
**For MALNAD GREENTECH INDUSTRIES**



## 6. Water Audit

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. Climate change has added another dimension to water crisis. The monsoon is becoming erratic and increased air temperature sucks up more water from water bodies and soil. Hence, it is essential to judiciously use every drop of water. Water auditing is conducted for the evaluation of facilities of raw water intake and determining the facilities for water treatment and reuse. Table 9 gives the details of the water management system exists in the institution. It is observed that, the institution is primarily dependent on ground water for its in house student's water requirements. However, tube well sources are not dependable. Table 10 gives the data on current utilization of rain water and its potential. It is observed that, there is scope for collection roof water and reduce the dependency on tube wells. Table 11 gives the data on water quality test.

**Table 9. Data on Water Sources of JNNCE**

Sl No.	Sources	Purpose of usage	Usage kilo liter/year
1	Municipal supply	Drinking and mess	4235
2	Ground water (Two tube wells)	Hostel and mess	42000
3	Rain water and canal water	Departments	15000
4	Recycled water	Gardening	54000
5	Surface flow water	Gardening	No data
	Total		115235
	Per capita water consumption for students and staff (Excluding gardening)		50



**Table 10. Details of Rain water harvesting system**

Particulars	Available area	Potential, kl/Y
Current utilization	No data on quantity of collection. 70% of the buildings have rain water collection facility.	
Scope for roof top rain water collection	Built up area of 50784 sq.m	35500
Surface flow rain water collection	Road and pavement area 56100 sq.m	22400
	Green area 33400 sq.m	6700
Total surface flow collection		29100
900 mm per year rain fall is assumed for JNNCE		
Collection coefficient of 0.7 us assumed for roof water		
Collection coefficient of 0.4 si assumed for road and pavement flow		
Collection coefficient of 0.2 assumed for green area		

Table 11 gives the results of water quality tests for different samples of water. It is found that, the untreated water has BOD, COD and TDS values beyond the stipulated maximum limit. As observed, the canal water quality is not good and it is being mixed with pure roof top rain water. The treated water parameters are within the specified limit. However, the canal water may contain heavy metals, agro chemicals and pesticides. These parameters are not tested. Hence, it is advisable to use the canal water only for gardening purposes. The tube well water has TDS value higher than the maximum safe limit. As it is being used for drinking and cooking purposes, it is to be ensured that, the quality of water after purification using water purifier systems meet the stipulated norms. As observed in the section on energy audit, the water supply system has more than forty pumps of various capacities and it is difficult to maintain these many pumps on regular basis. The system has to be restructured to have less than 10 number pumps.



**Table 11. Water quality test data**National Education Society <sup>®</sup>

JAWAHARLAL NEHRU NEW COLLEGE OF ENGINEERING

(Approved by AICTE and Affiliated to Visvesvaraya Technological University, Belagavi)

Navule, Savalanga Road, SHIVAMOGGA – 577204, Karnataka.

Department of water and waste water quality monitoring laboratory.

Test reports:

1) Analysis of Sewage water parameters:

A). Untreated (Raw water):

Parameters	Results in mg/l
1.pH	6.2
2.BOD	28
3.COD	107.78
4.Total suspended solids(TSS)	14
5.Total dissolved solids(TDS)	860

B). Treated water:

(Results from SLN testing laboratory recognized by MOEFCC and an ISO 9001:2015, Bangalore)

Parameters	Results in mg/l	KSPCB standards (mg/l)
1.pH	7.25	6.5-9.0
2.BOD	7.0	10 max
3.COD	42.0	50 max
4.TSS	8.7	20 max
5.Total Nitrogen	8.2	10 max
6.Ammonical Nitrogen	2.4	5 max
7.Fecal coliform	60	100 max

2).Analysis of campus water parameters:

Parameters	Borewell water (mg/l)	Channel water (mg/l)	Channel treated water (mg/l)	Municipal water (mg/l)	BIS for drinking water
1.pH	7.63	8.2	7.5	7.5	6.5 to 8.5
2.TSS	20	24	7	7	<10
3.TDS	74.82	70	29	18	<100
4.Biological contamination	Negative	Positive	Negative	Negative	Negative

Analysis by:  
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### 6.1 Observations and Suggestions on Water Management:

1. Roof top rain water system has potential to meet more than 75% of pure water requirement of the institution. Separate storage tanks need to be constructed for collecting the roof water.
2. Roof water and canal water are collected in one reservoir. The quality of canal water appears to be bad. Hence, usage of the same has to be avoided.
3. Tube well water quality is not good especially the TDS value is higher than the permissible limits. Measures have to be taken either to improve the quality or to use rain water.
4. Dead tube well can be recharged using surface flow water. Further, a lake or water body can be created to collect the surface flow rain water. This water body in addition to meet the gardening water requirement adds to the aesthetics of the campus.
5. Considering that, only about 10% of the total institution strength out of 4100 persons (Staff and students) reside in the campus hostels, per capita water consumption 50 liters is much higher than the standard value of 20 liter per person per day. It indicates significant wastage of water.





