Water Conservation Audit

Name of Organization	Mewar University
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Water Usage Assessment

Overall, Campus Water Usage

- What is the current water usage across the entire campus?

  Yes, Mewar University has a comprehensive water storage system across its campus, comprising various types of tanks with significant capacities. The Administrative and Academic Block, along with the Annapurna Mess and Education Block, is equipped with four underground RCC tanks, each holding 100,000 liters, totaling 400,000 liters. Additionally, the Administrative and Academic Block has two overhead RCC tanks, each with a capacity of 40,000 liters, summing up to 80,000 liters. The Guest House features a single overhead RCC tank with a capacity of 30,000 liters, while the Workshop has one overhead RCC tank that holds 50,000 liters. The MBA Building also includes an overhead RCC tank of 30,000 liters. The Panna Girls Hostel is fitted with an overhead RCC tank of 15,000 liters. Similarly, the Annapurna Mess has a 30,000-litre overhead RCC tank. The 2 BHK Residency is equipped with one 15,000-litre overhead RCC tank, whereas the 1 BHK Residency has two overhead RCC tanks, each holding 30,000 liters, totaling 60,000 liters. The 1 BHK Residency (B-Block) features four overhead RCC tanks, each with a capacity of 30,000 liters, amounting to 120,000 liters. The Kumba Hostel and the Pratap Hostel each have two overhead RCC tanks, each with a capacity of 20,000 liters, totaling 40,000 liters per hostel. The Sanga Hostel is equipped with two 30,000-litre overhead RCC tanks, summing up to 60,000 liters. The International Hostel has two overhead RCC tanks, each holding 40,000 liters, totaling 80,000 liters. Finally, the Meera Girl Hostel features a single overhead RCC tank with a capacity of 20,000 liters. Altogether, the total water storage capacity at Mewar University amounts to 950,000 liters.
  Reference fig/doc: - fig 11

- How does water usage vary between buildings, recreational areas, and landscaping?

  During an audit of water usage at Mewar University, it was found that buildings are the primary consumers of water on campus. Discussions with committee members responsible for water distribution highlighted several activities contributing to this high consumption. These activities include washing clothes, bathing, and cleaning, all of which demand significant amounts of water daily.

In hostels, students' daily routines, such as bathing and washing clothes, are major water-consuming activities. Each student typically uses several liters of water for these personal hygiene practices, leading to a substantial cumulative demand. Additionally, cleaning activities in the buildings, which include sweeping and mopping floors, cleaning bathrooms, and maintaining common areas, also contribute significantly to water usage. These tasks are essential for maintaining hygiene and health standards but result in considerable water consumption.

Administrative and academic buildings, though to a lesser extent, also contribute to the overall water usage. Water is used in restrooms, canteens, and for cleaning purposes, all adding to the daily water requirement. Moreover, maintenance activities such as plumbing repairs, HVAC system operations, and the upkeep of laboratory equipment in science departments necessitate water usage.

To address these issues, Mewar University has undertaken several water conservation initiatives. These include installing water-efficient fixtures like low-flow showerheads and faucets in hostels, using dual-flush toilets, and promoting the use of washing machines with high water efficiency. The university is also exploring the use of automated cleaning systems that use less water and adopting water recycling methods to treat and reuse greywater for non-potable purposes.

Furthermore, regular awareness programs are conducted to educate students and staff about water conservation practices, encouraging them to adopt habits that reduce water wastage. Through these efforts, Mewar University aims to optimize water use within its buildings, ensuring sustainability and responsible resource management.

Building Water Use

- Which buildings have the highest water usage, and why?

During an audit of water usage at Mewar University, it was found that buildings are the primary consumers of water on campus. According to discussions with teachers and the head faculty responsible for water management through the college administration, the highest water consumption is associated with the international hostel and the other student hostels. These buildings use substantial amounts of water for activities such as bathing, washing clothes, and cleaning. The daily routines of students, including personal hygiene and laundry, contribute significantly to this high usage.

Following the hostels, the hospital building is another major water consumer. The hospital requires large quantities of water for patient care, sanitation, medical procedures, and maintaining sterile environments. Frequent cleaning and disinfection processes further escalate water usage in this facility.

The administrative buildings also contribute to the overall water consumption, albeit to a lesser extent. These buildings use water in restrooms, canteens, and for regular cleaning and maintenance activities. The combined demand from these different types of buildings represents the bulk of the university's water usage.

In response to these findings, Mewar University has initiated several water conservations measures. These include installing water-efficient fixtures, promoting the use of water-saving appliances, and implementing greywater recycling systems for non-potable uses. Additionally, awareness programs are conducted to educate the university community on water conservation practices, encouraging responsible usage.

Through these initiatives, Mewar University aims to manage its water resources more sustainably, reducing overall consumption while maintaining necessary standards of hygiene and service.

- What types of fixtures (toilets, faucets, showers) are most common, and how efficient are they?

During an audit of water usage at Mewar University, it was determined that buildings are the primary consumers of water on campus. Through discussions with teachers and the head faculty responsible for water management via the college administration, it was revealed that the international hostel and other student hostels account for the highest water consumption. These hostels require substantial amounts of water for activities such as bathing, washing clothes, and cleaning. The daily routines of students, including personal hygiene and laundry, significantly contribute to this high usage.

Following the hostels, the hospital building is another major water consumer. The hospital requires large quantities of water for patient care, sanitation, medical procedures, and maintaining sterile environments. Frequent cleaning and disinfection processes further escalate water usage in this facility. The administrative buildings also contribute to the overall water consumption, albeit to a lesser extent. These buildings use water in restrooms, canteens, and for regular cleaning and maintenance activities.

The audit also revealed that the types of water fixtures (toilets, faucets, showers) in these buildings are a mix of old and modern designs. However, the majority are older fixtures, which tend to be less water-efficient compared to newer models. The presence of these older fixtures is a significant factor in the high-water consumption rates observed.

In response to these findings, Mewar University has initiated several water conservations measures. These include gradually replacing old fixtures with more water-efficient ones, such as low-flow toilets, faucets, and showerheads. Additionally, the university is promoting the use of water-saving appliances and implementing greywater recycling systems for non-potable uses. Awareness programs are also conducted to educate the university community on water conservation practices, encouraging responsible usage.

Through these initiatives, Mewar University aims to manage its water resources more sustainably, reducing overall consumption while maintaining necessary standards of hygiene and service.
Reference fig/doc: - fig 15, fig 23, fig 35, fig 36, fig 37

Irrigation and Landscaping

- How much water is used for irrigation purposes?

At Mewar University, approximately 1.5 lakh liters of water are dedicated to irrigation purposes. This substantial volume of water is essential for maintaining the lush fields, diverse plantations, and beautifully manicured gardens across the campus. The irrigation system ensures that these green spaces remain vibrant and healthy, contributing significantly to the campus's aesthetic appeal and environmental quality.

The fields, which may be used for recreational activities, sports, or academic purposes such as agricultural studies, benefit from regular watering to support various plant species. These fields not only provide functional spaces for the university community but also enhance the overall landscape of the campus.

The plantations, which include a variety of trees, shrubs, and other plant species, require consistent hydration to thrive. These plants play a crucial role in maintaining the ecological balance, providing shade, improving air quality, and supporting local wildlife. The university's commitment to nurturing these plantations demonstrates a dedication to environmental sustainability and biodiversity.

Additionally, the well-maintained gardens offer a serene and pleasant environment for students, staff, and visitors. These gardens serve as spaces for relaxation, study, and social interaction, significantly enhancing the campus experience. The careful irrigation of these gardens ensures that they remain a source of beauty and tranquility throughout the year.

Mewar University's use of a significant amount of water for irrigation underscores its dedication to preserving and nurturing its green spaces. This commitment not only enhances the visual appeal of the campus but also promotes a healthier and more sustainable environment for the university community. Through these efforts, the university demonstrates the importance of responsible water management and environmental stewardship.

- What types of irrigation systems are in place, and how efficient are they?

Mewar University boasts a variety of irrigation systems strategically implemented across its campus to ensure efficient water distribution and optimal plant growth. Among these systems are drip irrigation, sprinkler systems, direct watering, and manual plant pot watering, each serving specific needs and environments.

The drip irrigation system, known for its precision and water efficiency, delivers water directly to the plant's roots through a network of tubes or pipes with emitters. This method minimizes water wastage by precisely targeting the root zone, making it ideal for areas with dense planting such as gardens and landscaped areas.

Sprinkler systems, on the other hand, distribute water overhead in a uniform manner, resembling natural rainfall. These systems are well-suited for larger open spaces like fields and lawns, ensuring even coverage and promoting healthy growth across expansive areas.

Direct watering involves the manual application of water directly to the soil around individual plants or trees. This method allows for targeted watering, particularly useful for plants with specific water requirements or those situated in pots or containers.

Manual plant pot watering involves the manual application of water to plants housed in pots or containers. This hands-on approach ensures that each plant receives the appropriate amount of water, tailored to its individual needs.

By employing a diverse range of irrigation systems, Mewar University maximizes water efficiency and minimizes wastage while catering to the unique requirements of different areas on campus. These systems not only support the campus's greenery but also reflect the institution's commitment to sustainable water management practices. Reference fig/doc: - fig 30

Recreational Areas

- What is the water usage in recreational areas, including pools and athletic fields?

No written evidence found during the time of the audit

- Are there any practices in place for water conservation in these areas?

  no written evidence found during the time of the audit

Industrial and Laboratory Use

- How is water used in campus facilities such as cafeterias and laboratories?

  No written evidence found during the time of the audit

- Are there opportunities to reduce water usage in these areas?

  No written evidence found during the time of the audit

Cooling Systems

- How much water do cool systems consume across the campus?

  No written evidence found during the time of the audit

- Are there any water recycling practices in place for these systems?

  Mewar University boasts a comprehensive water recycling system, featuring a Sewage Treatment Plant (STP) and a rainwater harvesting unit located on its premises. The STP efficiently processes wastewater generated across the campus, ensuring that it meets regulatory standards before being discharged or reused. This system plays a crucial role in conserving water resources and minimizing the university's environmental footprint by treating and recycling wastewater for various non-potable purposes.

  In addition to the STP, the university has established a rainwater harvesting unit to capture and store rainwater for reuse. This unit harnesses the natural abundance of rainfall to supplement the campus's water supply, particularly during dry periods or water scarcity. By harvesting rainwater, Mewar University not only reduces its reliance on external water sources but also promotes sustainability and resilience in water management practices.

  Together, these components of the water recycling system underscore Mewar University's commitment to environmental stewardship and sustainable campus operations. Through the implementation of innovative water conservation measures, the university sets an example for responsible water management in educational institutions.
  Reference fig/doc: - fig 25, fig 26, fig 38

Water Conservation Audit

Infrastructure and Facilities

- Do all buildings on campus have water-efficient fixtures (e.g., low-flow toilets, faucets, and showers)?

  Mewar University has made significant strides in water conservation by outfitting all campus buildings with water-efficient fixtures, including low-flow toilets, faucets, and showers. These fixtures are designed to minimize water consumption without compromising functionality or user experience. However, it's important to note that the water-efficient fixtures are a mix of older and newer systems across the campus. While newer buildings may feature the latest water-saving technologies as standard, older buildings may still have older fixtures in place.

  This mixture of older and newer systems presents both opportunities and challenges. On one hand, the presence of water-efficient fixtures, regardless of age, demonstrates the university's commitment to sustainability and responsible water management. On the other hand, the inconsistency in fixture types across buildings may result in variations in water-saving potential and operational efficiency.

  To maximize water conservation efforts, Mewar University could consider a phased approach to upgrading older fixtures in existing buildings to newer, more efficient models. This would ensure uniformity in water-saving measures campus-wide and optimize water usage across all facilities. Additionally, ongoing maintenance and monitoring of all fixtures, regardless of age, are essential to ensure continued efficiency and effectiveness in water conservation efforts.
  Reference fig/doc: - fig 15, fig 23, fig 35, fig 36, fig 37

- Are there any leaks or issues with the water distribution system?

  No there are no leak or issue with the water distribution system as observed during the audit

- Are there irrigation systems on campus? If yes, how are they managed?

  At Mewar University, the irrigation system comprises various methods, including manual irrigation, sprinkler systems, and drip irrigation, employed across the campus. Manual irrigation involves the direct application of water to fields, with excess water left to drain away. Sprinkler systems are utilized to evenly distribute water over larger areas, such as athletic fields or recreational spaces. Additionally, drip irrigation, a highly efficient method, is observed in specific locations across the campus. Drip irrigation delivers water directly to the roots of plants, minimizing water wastage by reducing evaporation and runoff. While manual irrigation and sprinkler systems provide broader coverage, drip irrigation ensures targeted and efficient water

delivery, particularly in areas with specific water requirements or sensitive vegetation. However, the absence of smart controllers represents a potential area for improvement within the irrigation infrastructure. Implementing smart controllers could enhance the efficiency of all irrigation methods by optimizing watering schedules based on real-time weather data and soil moisture levels. By integrating smart technology with existing irrigation systems, Mewar University can further promote sustainable water management practices and reduce overall water consumption on campus.
Reference fig/doc: - Fig 30, fig 20

- Are they using efficient irrigation techniques (e.g., drip irrigation, smart controllers)?

  Mewar University has implemented efficient drip irrigation systems across its campus, specifically in fields and recreational areas. Drip irrigation delivers water directly to the roots of plants, minimizing water wastage through evaporation and runoff. However, the system currently lacks smart controllers, which could further optimize water usage. Smart controllers utilize weather data and soil moisture sensors to adjust watering schedules dynamically, ensuring plants receive the appropriate amount of water precisely when needed. By integrating smart controllers into the existing drip irrigation infrastructure, Mewar University can enhance efficiency, prevent overwatering, and reduce unnecessary water consumption. This investment in smart irrigation technology not only maximizes water savings but also promotes sustainable water management practices and reinforces the university's commitment to environmental conservation on campus.
  Reference fig/doc: - Fig 30, fig 20

- Are there any water features (e.g., fountains, ponds) on campus? If yes,

  No written evidence found during the time of the audit

- How are they maintained?

  No written evidence found during the time of the audit

- Evaluate pools, fountains, and other water features for recirculation practices and leakages.

  No written evidence found during the time of the audit

- Review water use in athletic fields, including irrigation efficiency.

  No written evidence found during the time of the audit

Rain Water Harvesting

- Is rainwater harvesting implemented on the college campus?

  Rainwater harvesting is an integral part of the college campus's sustainable water management strategy, as depicted on the rainwater harvesting map. This system captures and stores rainwater from rooftops, pavements, and other surfaces for various purposes, including irrigation, toilet flushing, and groundwater recharge.

  The rainwater harvesting map illustrates the layout and distribution of collection structures such as rooftop catchment systems, gutters, downspouts, and storage tanks across the campus. It provides a visual representation of the infrastructure designed to capture and utilize rainwater efficiently.

  By implementing rainwater harvesting, the college reduces reliance on traditional water sources and alleviates pressure on municipal water supplies. This practice promotes water conservation, mitigates the risk of flooding and erosion, and enhances resilience to droughts and water scarcity.

  Overall, the rainwater harvesting map serves as a valuable tool for promoting awareness, planning, and monitoring of rainwater harvesting initiatives on the college campus, reinforcing the institution's commitment to environmental sustainability and resource stewardship.
  Reference fig/doc: - Fig 19, fig 27

- What infrastructure is in place for rainwater collection (e.g., rain barrels, cisterns, rooftop collection systems)?

  Rainwater collected from the rooftops of buildings on the college campus is directed to a central collection point, typically a well, as part of the rainwater harvesting system. This system efficiently captures rainwater runoff and channels it to the well for storage and subsequent use.

  The collection process begins with the installation of gutters and downspouts along the edges of rooftops to capture rainwater. These channels guide the collected rainwater towards a central point where it is then diverted into the well.

  Once in the well, the rainwater is stored until needed for various purposes such as irrigation, groundwater recharge, or non-potable water usage. This stored rainwater can supplement conventional water sources, reducing the demand on municipal water supplies and promoting sustainable water management practices on the campus.

By utilizing rainwater harvesting techniques and directing collected rainwater to a well, the college demonstrates its commitment to conservation and environmental stewardship while ensuring a reliable water supply for campus activities.
Reference fig/doc: - Fig 19, fig 27

- What is the capacity of the rainwater harvesting system?

In various locations across the University campus, three storage tanks with capacities of 3938 cubic feet, 2880 cubic feet, and 2394 cubic feet, alongside a single well measuring 40 feet in diameter and 100 feet in depth, are strategically constructed for rainwater harvesting purposes. This infrastructure is designed to capture rainwater runoff, mitigating water runoff and maximizing resource utilization.

Rainwater harvesting serves multiple purposes, including recharging aquifers, enhancing groundwater quality through dilution, maintaining soil moisture levels, and reducing soil erosion by minimizing surface runoff. The collected rainwater is stored in the storage tanks and the well, ready for use in irrigation, landscaping, and other non-potable water needs across the campus.

By implementing rainwater harvesting techniques, the University not only promotes sustainable water management but also reduces its reliance on external water sources, contributing to environmental conservation and resilience. This initiative aligns with the institution's commitment to sustainability and responsible stewardship of natural resources.
Reference fig/doc: - fig 41

- How is the collected rainwater utilized on campus (e.g., irrigation, toilet flushing, cooling systems)?

Collected rainwater at Mewar University serves multiple essential purposes, primarily aimed at water conservation and groundwater recharge. One significant application involves utilizing the rainwater for playground drainage, ensuring efficient water management while minimizing runoff and soil erosion. Additionally, rainwater collected through roof rainwater harvesting is redirected to surface tanks or pits through a delivery system. This technique, known for its cost-effectiveness and efficiency, allows the university to harness rainwater for various needs.

The harvested rainwater is utilized for recharging groundwater, replenishing aquifers, and improving overall water quality through dilution. By adopting rainwater harvesting techniques, Mewar University demonstrates its commitment to sustainable water management practices. This initiative aligns with broader environmental conservation efforts, reducing the strain on municipal water sources and promoting self-sufficiency in water supply.

Furthermore, by integrating rainwater harvesting into its infrastructure, the university sets an example for urban houses and buildings, showcasing the effectiveness of this technique in mitigating water scarcity and fostering environmental resilience. Overall, Mewar University's proactive approach to rainwater harvesting contributes significantly to groundwater conservation and sustainable development.
Reference fig/doc: - fig 41

- Are there any filtration or treatment processes in place for harvested rainwater before use?

  No written evidence found for the treatment process in place for the harvested rainwater before use

- How is the maintenance of rainwater harvesting infrastructure managed?

  No written evidence found during the time of the audit

- Are there any challenges or limitations faced in implementing rainwater harvesting on campus?

  No written evidence found during the time of the audit

- What are the benefits associated with rainwater harvesting for the college campus (e.g., water conservation, cost savings, sustainability)?

  No written evidence found during the time of the audit

- Have there been any educational or awareness initiatives regarding rainwater harvesting for students and staff?

  No written evidence found during the time of the audit

- Are there any plans for expanding or optimizing the rainwater harvesting system in the future? If yes, what are they?

  No written evidence found during the time of the audit

Wastewater treatment and Sewage Treatment Plant (STP)

- Does the college campus have a Sewage Treatment Plant (STP) for treating wastewater?

Mewar University's commitment to sustainable practices extends to its wastewater management with the establishment of a sewage treatment plant (STP) on campus. This facility plays a crucial role in treating wastewater generated within the campus premises.

The sewage treatment process begins with the collection of wastewaters from various sources across the campus, including residential buildings, academic facilities, and recreational areas. This wastewater, which contains a mixture of domestic and commercial effluents, is transported to the STP for treatment.

Upon arrival at the sewage treatment plant, the wastewater undergoes a series of treatment processes designed to remove impurities and contaminants. These processes typically include physical, chemical, and biological treatments aimed at separating solids, breaking down organic matter, and disinfecting the water.

Once the treatment process is complete, the treated wastewater undergoes further purification to ensure compliance with environmental regulations and standards. This may involve additional filtration, disinfection, or other advanced treatment techniques to improve water quality and remove any remaining pollutants.

The treated wastewater, now deemed safe for discharge, can be reused for various non-potable purposes such as irrigation, flushing toilets, or groundwater recharge. This closed-loop approach to wastewater management not only conserves water resources but also minimizes the environmental impact of wastewater discharge.

By investing in a sewage treatment plant and implementing comprehensive wastewater management practices, Mewar University demonstrates its commitment to environmental stewardship and sustainable development. This initiative not only safeguards public health and protects natural ecosystems but also serves as a model for responsible water management within the broader community.
Reference fig/doc: - fig25, fig 26, fig 17, fig 40

- What is the capacity of the STP in terms of wastewater treatment volume?

The capacity of a Sewage Treatment Plant (STP) is crucial for understanding its ability to process wastewater efficiently. In general terms, the capacity of the STP is expressed in various units to provide a comprehensive overview of its capabilities.

At an hourly rate, the STP can process 14.5 cubic meters of sewage, equivalent to 14,500 liters. This hourly capacity showcases its immediate processing ability, ensuring a steady flow of wastewater treatment throughout the day.

On a daily basis, the STP can handle a substantial volume of sewage, amounting to 348 cubic meters or 348,000 liters. This daily capacity highlights the plant's ability to sustainably manage wastewater over extended periods, contributing to environmental protection and public health.

Expressed in cubic meters per hour and per day, as well as liters per hour and per day, these figures offer clarity regarding the STP's operational scale and efficiency. They serve as essential metrics for planners, engineers, and policymakers involved in wastewater management, guiding decisions related to infrastructure development, resource allocation, and environmental stewardship.

In summary, the STP's capacity of 14.5 cubic meters per hour, 14,500 liters per hour, 348 cubic meters per day, and 348,000 liters per day underscores its vital role in treating wastewater and safeguarding the health of communities and ecosystems.
Reference fig/doc: - fig 16

- What are the primary treatment methods employed in the STP (e.g., physical, chemical, biological)?

The primary treatment method employed in the Sewage Treatment Plant (STP) involves a series of essential steps aimed at efficiently removing contaminants from wastewater. Initially, the incoming wastewater is directed to a settling tank where its flow is deliberately slowed down. This facilitates the sedimentation process, allowing solid particles to settle at the bottom of the tank.

Following sedimentation, the water moves to the next chamber where additional treatment occurs. Here, chemical agents may be introduced to aid in the separation and aggregation of remaining suspended solids. These chemicals help to enhance the settling process, promoting the formation of larger particles that are easier to remove.

After chemical treatment, the water undergoes filtration, typically through a bed of sand or another suitable medium. This filtration step serves to further purify the water by trapping smaller particles and impurities that may have escaped sedimentation and chemical treatment. The filtration bed acts as a natural barrier, allowing only clean water to pass through while retaining contaminants within its porous structure.

Overall, this multi-stage treatment process effectively reduces the concentration of pollutants in the wastewater, producing treated water that meets regulatory standards for discharge or reuse. By combining sedimentation, chemical treatment, and filtration, the STP ensures the removal of suspended solids, organic matter, and other impurities, thereby safeguarding public health and the environment. This systematic approach underscores the importance of effective wastewater treatment in maintaining clean water resources and sustainable ecosystems.

Reference fig/doc: - fig 16, fig17, fig18, fig 25, fig 26

- How is wastewater collected and directed to the STP on campus?

  Wastewater from various locations within the college campus is collected through an underground network of pipes. These pipes are strategically laid out to ensure efficient drainage and collection of wastewaters from different areas of the campus, such as bathrooms, kitchens, and other facilities.

  The underground location of these pipes helps to minimize visual impact and potential disruptions to campus activities. It also ensures a discreet and organized system for wastewater management.

  Once collected, the wastewater is directed towards the Sewage Treatment Plant (STP) located on the campus. This centralization of treatment facilities allows for streamlined processing and treatment of wastewater generated within the college premises.

  By channeling all wastewater to the STP, the college can effectively manage and treat its sewage in an environmentally responsible manner. This approach helps to protect local water bodies from pollution and ensures compliance with regulatory standards for wastewater discharge.

  Overall, the integration of an underground piping network and on-campus STP reflects the college's commitment to sustainable wastewater management practices and environmental stewardship.

- What is the quality of treated effluent discharged from the STP?

  No written evidence found during the time of the audit

- Are there any measures in place to monitor and control odor emissions from the STP?

  No written evidence found during the time of the audit

- How is sludge generated during the treatment process managed (e.g., disposal, reuse)?

  No written evidence found during the time of the audit

- Are there any energy-efficient or sustainable practices incorporated into the operation of the STP (e.g., renewable energy usage, energy recovery)?

In the Sewage Treatment Plant (STP), the final stage of filtration ingeniously utilizes the natural filtration capabilities of soil layers. This innovative approach not only ensures thorough purification of wastewater but also significantly reduces energy consumption in the treatment process.

After undergoing initial treatment steps such as sedimentation and chemical treatment, the partially treated wastewater is directed to a specially designed area within the STP. Here, the water is allowed to percolate through layers of soil, each possessing unique filtration properties.

As the water moves downward through the soil layers, it undergoes further purification as impurities and contaminants are trapped and absorbed. This natural filtration process effectively removes remaining suspended solids, organic matter, and pathogens from the wastewater.

The utilization of soil filtration as the final treatment stage offers several advantages. Firstly, it requires minimal energy input compared to mechanical filtration methods, thereby reducing operational costs and environmental impact. Additionally, the process harnesses the inherent filtering capabilities of soil, making it a sustainable and eco-friendly solution for wastewater treatment.

By integrating soil filtration into the STP design, the college demonstrates a commitment to innovative and environmentally conscious wastewater management practices. This approach not only ensures the production of high-quality treated water but also promotes sustainability and resource efficiency in campus operations.
Reference Fig/doc: - fig 15, fig 16, fig17, fig18, fig 40

- How is the maintenance of the STP infrastructure and equipment conducted?

The maintenance of the Sewage Treatment Plant (STP) infrastructure and equipment is outsourced to a third-party service provider. This arrangement allows the college to benefit from specialized expertise and resources dedicated to the upkeep of the STP facilities.

By entrusting maintenance tasks to a third-party contractor, the college can ensure that the STP operates efficiently and effectively without diverting internal resources from its core activities. The service provider is responsible for conducting regular inspections, performing preventive maintenance, and addressing any repairs or issues that may arise to ensure the continuous and reliable operation of the STP.

Outsourcing maintenance to a third party also offers the advantage of access to a broader range of technical skills and experience in wastewater treatment. This collaborative approach helps to optimize STP performance, minimize downtime, and

prolong the lifespan of equipment, ultimately contributing to sustainable and cost-effective wastewater management on campus.
Reference fig/doc: - fig 21

- Are there any plans for upgrading or expanding the STP in the future? If yes, what are they and what factors are driving these plans?

No written evidence found during the time of the audit

Findings

- What are the major sources of water consumption on campus?
  Building area,
- Where are the most significant opportunities for water conservation identified?

- Were any leaks or inefficiencies found during the audit?

Based on the investigation conducted at Mewar University, several findings and observations regarding water usage, conservation practices, and infrastructure maintenance can be summarized.

1. **Recreational Areas and Athletic Fields**:

   a. The water usage in recreational areas, including athletic fields, was not explicitly documented.
   b. There were no apparent practices in place specifically for water conservation in these areas.
   c. Opportunities exist for implementing water-saving measures such as efficient irrigation systems and drought-resistant landscaping to reduce water usage in recreational areas and athletic fields.
2. **Campus Facilities**:

   a. Water usage in campus facilities such as cafeterias and laboratories were not detailed in available records.
   b. There are likely opportunities to reduce water usage in these areas through measures such as installing water-efficient appliances and implementing water-saving practices.
3. **Cooling Systems**:

   a. The amount of water consumed by cooling systems across the campus was not quantified.
   b. Implementing water-efficient cooling technologies and practices could help reduce water consumption in cooling systems.
4. **Water Features**:

a. No information was found regarding water features such as fountains on campus.
b. If water features exist, maintenance practices should include regular inspection for recirculation efficiency and addressing any leakages promptly.

5. Rainwater Harvesting:

a. There was no evidence of filtration or treatment processes in place for harvested rainwater before use.
b. The maintenance of rainwater harvesting infrastructure was not documented.
c. Challenges or limitations in implementing rainwater harvesting on campus were not identified.
d. Benefits of Rainwater Harvesting: The benefits associated with rainwater harvesting, such as water conservation, cost savings, and sustainability, were not explicitly addressed.
e. Educational or awareness initiatives regarding rainwater harvesting for students and staff were not found.
f. Future Plans: There was no information regarding plans for expanding or optimizing the rainwater harvesting system in the future.

6. Sewage Treatment Plant (STP):

a. The quality of treated effluent discharged from the STP was not evaluated.
b. Measures to monitor and control odor emissions from the STP were not specified.
c. Management of sludge generated during the treatment process, such as disposal or reuse, was not described.
d. There was no indication of plans for upgrading or expanding the STP in the future.

In summary, while Mewar University may have water usage and conservation practices in place, documentation and monitoring of these practices appear to be lacking. Implementing comprehensive water management strategies, including efficient irrigation systems, water-saving measures in campus facilities, and proper maintenance of water infrastructure, could enhance sustainability efforts and reduce water consumption on campus. Additionally, investing in rainwater harvesting and wastewater treatment technologies could further contribute to water conservation and environmental stewardship.

Recommendations

- What are the specific recommendations for reducing water consumption in buildings?
- How can irrigation and landscaping practices be improved for better water conservation?
- What changes can be made to recreational areas to reduce water usage?
- How can water efficiency be improved in industrial and laboratory settings?
- What are the recommended upgrades or changes to cooling systems for better water conservation?

Based on the findings and observations at Mewar University regarding water usage, conservation practices, and infrastructure maintenance, several key recommendations can be proposed to improve water management and sustainability efforts on campus.

1. **Documentation and Monitoring**: Establish a comprehensive system for documenting and monitoring water usage across all areas of the campus, including recreational areas, athletic fields, and campus facilities. This should include regular metering of water consumption and the implementation of data tracking systems to identify trends and areas for improvement.

2. **Water Conservation Practices in Recreational Areas and Athletic Fields**: Develop and implement water-saving measures such as efficient irrigation systems and the use of drought-resistant landscaping in recreational areas and athletic fields. This could include the installation of smart irrigation controllers that adjust watering schedules based on weather conditions and soil moisture levels.

3. **Campus Facilities:** Conduct a detailed audit of water usage in campus facilities such as cafeterias and laboratories to identify opportunities for reducing water consumption. Consider installing water-efficient appliances and fixtures, such as low-flow faucets and toilets, and implementing water-saving practices, such as fixing leaks promptly and encouraging staff and students to use water responsibly.

4. **Cooling Systems**: Assess the water consumption of cooling systems across the campus and explore opportunities for implementing water-efficient cooling technologies and practices. This could include the installation of cooling towers with high-efficiency fill media and the optimization of cooling system operations to minimize water usage while maintaining thermal comfort levels.

5. **Water Features**: If water features such as fountains exist on campus, develop and implement a maintenance plan to ensure efficient operation and minimize water waste. This should include regular inspection for recirculation efficiency, addressing

any leakages promptly, and considering alternative water sources, such as harvested rainwater or recycled water, for fountain operation.

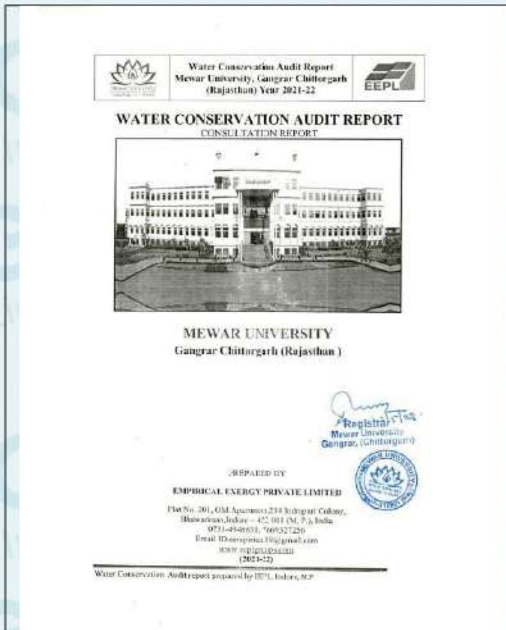
6. **Rainwater Harvesting**: Develop and implement a rainwater harvesting program to capture and utilize rainwater for non-potable purposes on campus. This could include installing rainwater harvesting systems on rooftops and other impervious surfaces, implementing filtration or treatment processes to ensure water quality, and establishing a maintenance plan to ensure the continued effectiveness of the infrastructure.

7. **Educational and Awareness Initiatives**: Launch educational initiatives to raise awareness among students, faculty, and staff about the importance of water conservation and sustainability. This could include organizing workshops, seminars, and awareness campaigns to promote water-saving practices and encourage behavior change.

8. **Future Planning**: Develop a long-term water management plan that includes strategies for expanding and optimizing water conservation efforts on campus. This could include setting targets for water reduction, investing in infrastructure upgrades and improvements, and incorporating water-saving technologies into future campus development projects.

By implementing these recommendations, Mewar University can strengthen its commitment to water conservation and sustainability, reduce water consumption, and minimize its environmental impact. Additionally, these measures can help the university achieve cost savings, improve operational efficiency, and enhance its reputation as a leader in sustainable campus management.

Appendix table: 1



Water Conservation Audit Report
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(Rajasthan) Year 2021-22

WATER CONSERVATION AUDIT REPORT
CONSULTATION REPORT

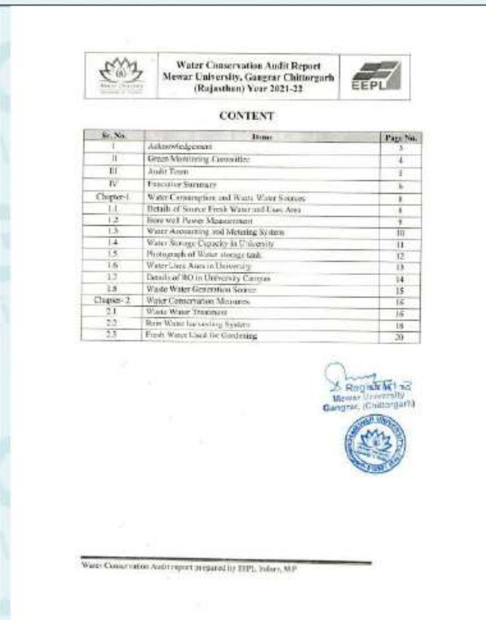
MEWAR UNIVERSITY
Gangrar Chittorgarh (Rajasthan)

Registrar
Mewar University
Gangrar, (Chittorgarh)

PREPARED BY
EMPIRICAL EXERGY PRIVATE LIMITED
(2021-22)

Water Conservation Audit report prepared by EEPL, Indore, M.P

Fig 1: Page 1



Water Conservation Audit Report
Mewar University, Gangrar Chittorgarh
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EEPL

ACKNOWLEDGEMENT

Empirical Energy Private Limited (EEPL), Indore (M.P) takes this opportunity to appreciate & thank the management of Mewar University Gangrar Chittorgarh for allowing us to conduct an water audit for the university.

We are indeed touched by the helpful attitude and co-operation of all faculties and technical staff, who rendered their valuable assistance and co-operation during the study.

Rajesh Kumar Singadiya
(Director)
M.Tech (Energy Management), PhD (Research Scholar)
Accredited Energy Auditor [AEA-0284]
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(BEE, Ministry of Power, Govt. of India)
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Certified Water Auditor (NPC, Govt of India)
Chartered Engineer [M-16991:K], The Institution of Engineers (India)
Member of ISHRAE

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Fig 3: Page 3

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EEPL

Green Monitoring Committee

OFFICE OF THE REGISTRAR
MEWAR UNIVERSITY, CHITTORGARH (RAJ.)

OFFICE ORDER

Reconstitution of Green, Environment & Energy Auditing Committee

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EEPL

The Audit Team

The study team constituted of the following senior technical executives from **Empirical Energy Private Limited.**

- **Mr. Rajesh Kumar Singadiya** [Director & Accredited Energy Auditor AEA-0284]
- **Mr. Rakesh Pathak,** [Director & Electrical Expert]
- **Dr. Suresh Kumar Soni** [Certified Energy Auditor & Energy Expert]
- **Mr. Sachin Kumawat** [Sr. Project Engineer]
- **Mr. Lokesh Kumar Varma** [Project Engineer]
- **Mr. Mohit Malviya** [Fire safety Engineer]
- **Mr. Ashish Kumawat** [Site Engineer]
- **Mr. Ajay Nahra,** [Sr. Accountant & admin]

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EXECUTIVE SUMMARY

The executive summary of the water conservation audit report furnished in this section briefly gives the identified water conservation measures, that can be implemented in a phased manner to conserve water and increase the productivity of the university.

WATER CONSEVATION INITIATIVE TAKEN BY UNIVERSITY: -

- **WASTEWATER TREATMENT PLANT: -**
  University has installed a sewage treatment plant (STP) for wastewater generated in various activities on the university campus. The output of the plant is 14.5 m³/hr. University has utilized treated water for gardening purposes. **It's appreciable.**
- **RAIN WATER HARVESTING SYSTEM: -**
  The university has a "Rainwater Harvesting System" on the institute campus for maintaining the groundwater level. This system saves about 70 to 80 % of the rooftop rainwater of the building. It is appreciable.
- **Sprinkler system:-**
  University has installed a water sprinkler system for garden, lawn area. **Its appreciable.**

RECOMMENDATION

WATER MONITORING SYSTEM

- University is required to installation of water flow meters to quantify the real-time water consumption of the university.
- Installation of a **"Cloud-based (IoT based) groundwater extraction monitoring system"** for the bore well to quantify freshwater consumption per day in the university.

DRIP WATER IRRIGATION

- Use a drip water irrigation system for plants and trees.

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USE EFFICIENT WATER TAPS.

- Water saving taps either reduce water flow or automatically switch off to help save water. So, it is highly recommended to install efficient water taps in university to reduce water consumption.

USE EFFICIENT URINAL TAPS.

- Replacing these inefficient fixtures with water sense labelled flushing urinal can save between 0.5 to 04 liter per flush without sacrificing performance. Installing water saving flushing urinal will not only reduce water use in facilities but also save pumping energy on water bills.

INSTALLATION OF WATER OVERFLOW SENSOR IN TANKS: -

- It was observed that water overflow in overhead tanks after tank filling. So, it is recommended installation of water overflow sensor to avoid water overflow.

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Fig 7: Page 7

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CHAPTER- 1
WATER CONSUMPTION AND WASTEWATER SOURCES

1.1 Details of source of fresh water and use areas:

The main source of freshwater is Borewell for the university. The freshwater is mainly used for drinking, housekeeping, gardening, domestic activity, and new construction project. Details of the pumps are given in the table.

Table 1.1 Details of Freshwater sources.

Sr. No.	Fresh Water Sources	Location	Motor Power (HP)	Remark
1	Open Well	The back side of the Ganga hostel	10	For Freshwater Supply
2	Borewell-01	Near Open Well	5	For Freshwater Supply
3	Borewell-02	The back side of the Mess	5	For Freshwater Supply
4	Borewell-03	Near Temple	7.5	For Freshwater Supply
5	Borewell-04	Near STP Plant	5	For Freshwater Supply
6	Borewell-05	Near MBA building	3	For Freshwater Supply
7	Transfer Pump-01	UG Tank Near Mess	5	Transfer Pump
8	Transfer Pump-02	UG Tank Near Khajuri	5	Transfer Pump
9	Transfer Pump-03	UG Tank Near Khajuri	5	Transfer Pump
10	Transfer Pump-04	UG Tank near MBA Tank	7.5	Transfer Pump
11	Transfer Pump-05	STP outlet	5	Transfer Pump

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1.2 Water Flow Measurement and Power measurement :

Table 1.2 : Flow and power measurement of borewells

Sr. No.	Fresh Water Sources	Location	Motor Power (HP)	Voltage	Current	Power Factor	Power Consumption (kW)	Measured Water Flow (m3/hr)	Working Hrs./day	Water Extraction (m3/day)
1	Open Well	Back side of Ganga hostel	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	Borewell-01	Near Open Well	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	Borewell-02	Back side of Mess	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	Borewell-03	Near Temple	7.5	Under Maintenance						0
5	Borewell-04	Near STP Plant	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6	Borewell-05	Near MBA building	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7	Transfer Pump	UG Tank Near Mess	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8	Transfer Pump-01	UG Tank Near Khajuri	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
9	Transfer Pump-02	UG Tank Near Khajuri	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10	Transfer Pump	UG Tank near MBA Tank	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11	Transfer Pump	STP outlet	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Average total water extraction/day									[illegible]

Observation: [illegible]

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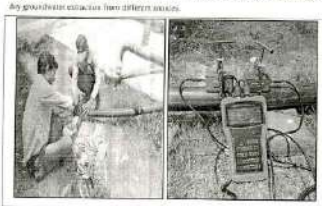
1.3 Water accounting & metering system:
It was observed that there is a requirement for water flow meters on borewells to quantify per day groundwater extraction from different sources.



Ultrasonic flow Meter installation at university tank

Water measurement by bucket method

Measurement at STP outlet

Figure- 1.1 Water flow measurement on the university campus.

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1.4 Water storage capacity in University campus: -

There are different types of tanks available in the university for water storage like Underground RCC tanks, Overhead RCC tanks, PVC tanks, etc.

Table 1.3: - Water Storage tank in university campus

Sr. No	Location	Type of Tank	Unit Capacity (Liter)	Quantity	Total Capacity (Liter)	Total Capacity (Kilo Liter)
1	Administrative and Academic Block, Annapurna Mess and Education Block	Underground (RCC tank)	1,00,000	4	4,00,000	400
2	Administrative and Academic Block	Overhead tank (RCC)	40,000	2	80,000	80
3	Guest House	Overhead tank (RCC)	30,000	1	30,000	30
4	Workshop	Overhead tank (RCC)	50,000	1	50,000	50
5	MBA Building	Overhead tank (RCC)	30,000	1	30,000	30
6	Panna Girls hostel	Overhead tank (RCC)	15,000	1	15,000	15
7	Annapurna Mess	Overhead tank (RCC)	30,000	1	30,000	30
8	2 BHK residence	Overhead tank (RCC)	15,000	1	15,000	15
9	1 BHK Residence	Overhead tank (RCC)	20,000	3	60,000	60
10	1 BHK Residence (B-Block)	Overhead tank (RCC)	30,000	4	1,20,000	120
11	Kumbha Hostel	Overhead tank (RCC)	20,000	2	40,000	40
12	Pratap Hostel	Overhead tank (RCC)	20,000	2	40,000	40
13	Sanga Hostel	Overhead tank (RCC)	30,000	2	60,000	60
14	Bhama Shah (International Hostel)	Overhead tank (RCC)	16,000	5	80,000	80
15	Meera Girls Hostel	Overhead tank (RCC)	20,000	1	20,000	20
	Total Water Storage Capacity of Mewar university =				9,50,000	1070

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1.5 Photographs of water storage tanks.

Fresh Water Storage tank

RO Treated water storage tanks

Fig - 1.2 Water Storage Tank and capacity of University Campus

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1.6 Water use areas on University Campus: -

Water is preliminary used for drinking, domestic, gardening, and clinical activity. The audit team visited various departments and buildings to determine appliances. The details of the washroom, toilet, and taps are given on the table

Table: 1.4 Details of washroom and Uses Taps in various areas

Admin block						
Sr.No.	Location	Urinals	Hand wash	Toilets	Taps	Drinking Taps
1	Basement	14	23	23	46	22
2	First floor	13	26	28	56	
3	Second floor	18	25	33	66	
4	Third floor	22	27	37	74	
M.B.A. Block						
Sr.No.	Location	Urinals	Hand wash	Toilets	Taps	Drinking Taps
1	Ground floor	5	8	6	12	4
2	First floor	5	8	6	12	4
3	Second floor	5	8	6	12	4
4	Third floor	5	8	6	12	4
Engineering Block						
Sr.No.	Location	Urinals	Hand wash	Toilets	Taps	Drinking Taps
1	Ground floor	4	4	6	12	4
2	First floor	5	4	5	10	4
3	Second floor	3	4	6	12	4

Sr. No.	Location	Urinals	Hand wash	Toilet	Bathroom	Taps	Drinking Taps
1	Bhamashah International Hostel	0	114	114	0	228	4
2	Sanga Boys Hostel	16	28	32	32	64	16
3	Kumbha Boys Hostel	16	24	32	32	64	16
4	Pratap Boys Hostel	24	48	48	48	96	8
5	Panna Dhai Girls Hostel	0	12	32	32	64	16
6	SC Meera Girls Hostel	0	12	24	24	48	8

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1.7 Details of RO in University Campus.

Table 1.5: - Details of RO on the campus.

Sr. no	Location	Capacity (Liter)	Quantity
1	Main Building	500	1
2	Veg Mess	500	1
3	Kumbha Hostel	100	1
4	Pratap Hostel	100	1
5	Sanga Hostel	100	1
6	Panna Hostel	100	1
7	Guest house	50	1
8	Meera Hostel	100	1
9	1 BHK (B- Block)	50	1
10	MBA Building	100	1
11	Bhama Shah International Hostel	50	1

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1.8 Waste Water Generation sources: -

At present wastewater is generated from various departments, canteen, mess, hostels like washrooms, handwash, and washing of medical equipment in Pharmacy department and RO rejected water treated in STP plants. After that treated water university to be reused in gardening.

Table: - 1.6 Wastewater generation area on the university campus

Sr. No	Key Water Usage Section	Type of water used (raw, treated, etc.)	Water Consuming activities
1	Admin Block	Fresh Water	Drinking and other uses
2	Hostels	Fresh Water	Drinking, Food cooking, other Uses
3	Institution Buildings	Fresh Water	Drinking and other uses
4	Canteen /Mess	Fresh Water	Food cooking, drinking
5	Residential	Fresh Water	Drinking, domestic and other activities
6	Guest House	Fresh Water	Drinking and other uses

- Some photographs of wastewater generation sources are given

Figure:- 1.3 Waste Water Generation sources

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CHAPTER- 2
WATER CONSERVATION MEASURES

Water conservation Measures

2.1 Waste Water Treatment Plant: -

University has installed an STP plant for wastewater treatment. After the water treatment is utilized for the gardening purpose.

The layout of the STP plant: -

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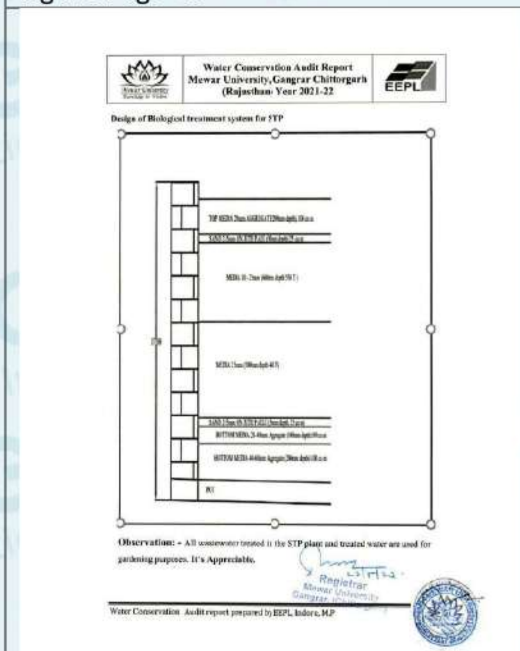
Fig 16: Page 16



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Design of Biological treatment system for STP

Observation: - All wastewater treated in the STP plant and treated water are used for gardening purposes. It's Appreciable.

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2.2. Rainwater Harvesting systems

Rainwater harvesting is a technique to capture the rainwater when it precipitates, store that water for direct use or charge the groundwater and use it later.

There are typically four components in a rainwater harvesting system:

- Roof Catchment.
- Collection.
- Transport.
- Infiltration or storage tank and use.

If rainwater is not harvested and channelized it runoffs quickly and flows out through storm-water drains. For storm-water management, the recharge pits, percolation pits, and porous trenches are constructed to allow stormwater to infiltrate inside the soil.

Figure: - 2.1 Components of a rooftop rainwater harvesting system

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Rainwater harvesting system in Mewar University:

University has rainwater harvesting systems on campus.

Figure 2.2:- Rain Water Harvesting System on the university campus

Observation:-

University has installed rainwater harvesting system in the campus for recharge the rain water in university. Its appreciable.

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Fig 19: Page 19

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2.3 Fresh Water uses for Gardening:

University has installed a water sprinkler system for the lawn area in front of the main university admin block. **Its appreciable.**

Figure 2.3:- Water Sprinkler system in university lawn

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Mewar University

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Fig 20: Page 20

Green Tech Engineers

"Water Saved is Water Generated"

To,

28/02/2024

The Vice Chancelor
Mewar University
Gangrar, Chittorgarh.

Visit Report

Sir,

I had visited your campus on 24th Feb.2024 to see the status of the sewage treatment plant based on GEO GREEN BIOFILTERS (SOIL BIOTECHNOLOGY) a natural process of treating sewage water developed at IIT Bombay, which was commissioned in the year 2012.

After seeing the STP I have made few suggestions which I am writing down as under.

1. The Pumps are to be replace with sewage cutter pumps to avoid the blockage with solids.
2. The Pipe network on the Bioreactor is to be replace with UPVC pipes so that the cleaning of the pipes can be done regularly.
3. More plantation is required on the bioreactor bed to provide oxygen for the plants.
4. The treated water sample was collected for testing and there was no foul smell in the treated water. Still if the quality of treated water is to be improved I suggest to install a Ozon generator to supply Ozon into the treated water tank so after storing the water for a longer period foul smell can be removed.
5. I was told that the university has been getting the treated water tested periodically and I have checked the reports and found them to be OK.

With these suggestions I would like to conclude,

With due regards,

For Green Tech Engineers

Yogesh Kalera
B.E.(Civil)

1148, Barkat Nagar (South), Kings Road, Jaipur-302019 • Ph. (0141-2811296 • Mob. 9829066840

Fig 21: Report of STP plant visit

NAKSHATRA ENVIRO SERVICES

Plot No. 46, Solitaire Industrial Park, Phase I, Dahmi Kalan, Bagru (Ext.), Jaipur - 303007
Website : www.nakshatraenviro.in | M.: 9413666777, 8003896245
E-mail : neslab2004@gmail.com, nakshatraenviro@gmail.com

Recognized by Ministry of Environment, Forest and Climate Change, Government of India
ISO 9001 : 2015, ISO 14001 : 2015 & ISO 45001 : 2018 Certified Laboratory

Reference No :NES-ENV-240223029 | Date: 02/03/2024

TEST CERTIFICATE
WASTE WATER QUALITY ANALYSIS

Issued to	Mewar University
Address	Village and Post Gangrar, Tehsil & District Chittorgarh, Rajasthan, 312901
Nature of Industry	Academic Institution
SAMPLE DETAILS	
Sample Reference/Source	ETP Treated Water
Sample Quantity	2.0 Litre
Sample Condition	Sealed
Sample Collected By	Customer Representative
Date of Sample Receipt	23/02/2024
Period of Testing	23/02/2024 to 02/03/2024

TEST RESULTS

Sl. No.	Parameters	Unit	Values Found	Permissible Limits	Test Method
1.	pH	-	7.15	5.5 to 9.0	IS 3025 (P-11) : 1983, RA 2022
2.	Total Dissolved Solid	mg/l	570	<2100	IS 3025 (P-16) : 2023
3.	Total Suspended Solids	mg/l	43.0	<100	IS 3025 (P-17) : 1984, RA 2022
4.	Biochemical Oxygen Demand (at 3 days 27°C)	mg/l	14.0	<30	IS 3025 (P-44) : 1993, RA 2023
5.	Chemical Oxygen Demand	mg/l	38.0	<250	IS 3025 (P-58) : 2006, RA 2023
6.	Oil & Grease	mg/l	6.0	<10	IS 3025 (P-39) : 1991, RA 2021

Note: B.D.L. – Below Detection Limit

- This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law and should not be used in any advertising media without special permission in writing.
- Total liability of this laboratory is limited to the invoice amount.
- The results indicated refer only to the above sample and applicable parameters. Endorsement of products is neither inferred nor implied.
- Samples will be destroyed after 15 days from the date of issuing of analysis of report unless otherwise specified.

(Lokendra Singh)
Review By

Seal

(Saurabh Sharma)
Authorised Signatory

*** END OF REPORT ***

Fig 22: Report of the STP water testing in the campus

Fig 23: Save water poster


Fig 24: Submersible pump


Fig 25: Well of that stores the water of stp


Fig 26: Water storage from stp


Fig 27: Drainage system for the water movement in the campus


Fig 28: Water movement out of the campus through the hole creating a problem

	
Fig 29: Water cooler in the campus	Fig 30: Drip irrigation in the field operated through this machine
	
Fig 31 : Water tank above the college hostel	Fig 32: Water drainage outside the hostel area
	
Fig 33 : Pipe supply for water above the hostel	Fig 34: Water sink

	
Fig 35: Boys washroom in the hostel	Fig 36: Boys toilet in the hostel
	
Fig 37 : Bathing water tap in the Mewar university	Fig 38: Rain water harvesting

	
Fig 39 : Rain water harvesting	Fig 40: Water cleaning way after the STP
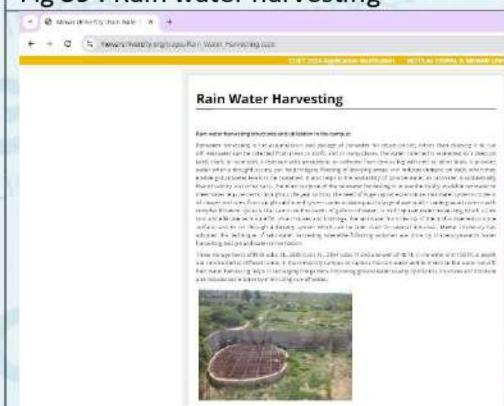	
Fig 41: Rainwater harvesting in mewar university detail in the website	

Appendix 2

General tips

Here are 50 general tips for water conservation:

1. Here are 50 water conservation tips tailored for Mewar University:
2. Ensure prompt repair of leaks in faucets, pipes, and toilets across campus buildings.
3. Install low-flow showerheads and faucet aerators in dormitories and bathrooms to reduce water usage.
4. Encourage students to take shorter showers to conserve water in dormitories and residential areas.
5. Promote turning off taps while brushing teeth or shaving in all campus restrooms.
6. Use brooms instead of hoses to clean pathways, sidewalks, and courtyards around campus buildings.
7. Water outdoor plants and lawns early in the morning or late in the evening to reduce water loss through evaporation.
8. Choose drought-resistant plants for landscaping on campus grounds.
9. Mulch garden beds and planters across campus to retain soil moisture.
10. Install rainwater harvesting systems with barrels or tanks to collect rainwater for outdoor watering.
11. Encourage the use of pool covers to reduce evaporation in campus swimming pools.
12. Run dishwashers and laundry machines in campus cafeterias and laundries only with full loads.
13. Advise cafeteria staff to scrape dishes instead of rinsing them before loading them into the dishwasher.
14. Provide sink stoppers for washing dishes by hand in campus kitchen facilities.
15. Consider installing dual-flush toilets in campus restrooms to reduce water usage for flushing.
16. Encourage composting in campus dining facilities instead of using garbage disposals, which require water.
17. Promote the reuse of water from cooking pasta or vegetables for watering plants in campus gardens.
18. Install rain sensors on campus irrigation systems to prevent watering during rainfall.
19. Use shut-off nozzles on hoses for campus landscaping and gardening to prevent water waste.
20. Check sprinkler heads for leaks and adjust them for optimal coverage on campus lawns and sports fields.
21. Use brooms or leaf blowers to clean outdoor surfaces instead of hoses around campus buildings.
22. Educate campus residents about the benefits of harvesting and reusing greywater from sinks and showers for non-potable purposes.
23. Upgrade campus appliances to water-efficient models, including washing machines and dishwashers in campus facilities.

24. Encourage the use of buckets and sponges for washing vehicles instead of hoses in campus maintenance areas.
25. Utilize timers for outdoor irrigation systems on campus to prevent overwatering.
26. Insulate water pipes in campus buildings to prevent heat loss and reduce the need to run taps.
27. Plant trees strategically on campus to provide shade and reduce water evaporation from soil.
28. Monitor campus water bills for unusual spikes in usage that may indicate leaks or inefficiencies.
29. Promote awareness of local water restrictions and encourage compliance among campus residents and staff.
30. Use rain gauges to measure rainfall on campus and adjust irrigation schedules accordingly.
31. Upgrade campus facilities with water-efficient showerheads, toilets, and faucets during renovations or upgrades.
32. Consider installing greywater recycling systems in campus buildings to reuse water from sinks, showers, and laundry facilities.
33. Use organic mulch around campus plants and trees to retain moisture and suppress weed growth.
34. Install rain sensors or smart irrigation controllers on campus to adjust watering schedules based on weather conditions.
35. Encourage the use of rain barrels to collect and store rainwater for outdoor use in campus gardening and landscaping projects.
36. Repair or replace leaking irrigation pipes and hoses on campus to prevent water loss.
37. Water lawns and gardens deeply and infrequently to promote deep root growth and drought tolerance on campus.
38. Utilize brooms instead of hoses to clean outdoor surfaces like sidewalks, pathways, and parking lots on campus.
39. Upgrade campus appliances to water-efficient models, such as dishwashers and washing machines in campus facilities.
40. Choose native or drought-tolerant plants for campus landscaping to reduce the need for irrigation.
41. Install rain sensors on campus irrigation systems to prevent watering during rainy weather.
42. Use pool covers on campus swimming pools to reduce evaporation and heat loss.
43. Use timers or moisture sensors to control irrigation systems on campus and prevent overwatering.
44. Replace traditional lawn grass with drought-tolerant alternatives or artificial turf on campus grounds.
45. Repair leaks promptly in faucets, toilets, and irrigation systems across campus to prevent water waste.
46. Educate students, faculty, and staff about the importance of water conservation and encourage sustainable water use practices on campus.

47. Promote student-led initiatives for water conservation and sustainability on campus, such as organizing awareness campaigns and implementing water-saving measures in dormitories and common areas.
48. Implement water-saving measures in campus laboratories and research facilities, such as using water-efficient equipment and adopting practices for minimizing water usage during experiments and processes.
49. Conduct regular maintenance checks on campus water fixtures, appliances, and irrigation systems to ensure efficient operation and prevent water leaks and wastage.
50. Partner with local community organizations, government agencies, and water conservation groups to share resources, expertise, and best practices for water conservation and sustainability initiatives.
51. Celebrate achievements and milestones in water conservation efforts on campus, recognize individuals and groups for their contributions, and continue to strive for continuous improvement in water management and conservation practices at Mewar University.

Signature: -

eSign
Signed by: ASHUTOSH TIWARI
Reason: Certified Copy
Location: Gurgaon,India
Date: 24-Oct-2024 (10:43 AM)

Inspection Engineer