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ONLINE TRAINING BY KRISHNAJI PAWAR

LEED AP(BD+C), GSAS CGP, GCP, ISO 14001

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MODULE
20C

Water Conservation Process / Wastewater Management

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Water conservation is a crucial practice that involves the strategic management and utilization of water resources to minimize waste and ensure sustainable access to this vital resource. As global populations continue to rise and climate change exacerbates water scarcity, the importance of effective water conservation practices cannot be overstated.

Learning Objectives +

- **Benchmarking with Performance Metrics**
- **Water Conservation**
- **Commissioning in Sustainable Construction**
- **Energy and Materials Use and Management**
- **Summary and Resources**
- **HBDP Practice Test V.4.1_Test Your Knowledge!**



PROCESS AND WASTEWATER MANAGEMENT

- Wastewater management is a systematic approach to treating and managing water contaminated by human activities.
- It's crucial for environmental sustainability, public health, and resource conservation.
- Wastewater management can lead to waterborne diseases, protect aquatic life, and recover valuable resources.
- The process includes collection, pre-treatment, primary treatment, and disposal or reuse.
- Pre-treatment removes large solids and debris, while primary treatment targets remaining pollutants.
- The final step involves disposal or reuse of treated water, which can be discharged to water bodies or reclamation and reused for irrigation, industrial processes, or potable water supply.
- Wastewater management is essential for safeguarding public health and the environment, and innovations in wastewater treatment and resource recovery are vital for sustainable water management.

A hand holding a glowing lightbulb, symbolizing an idea or innovation. The background features a network of nodes and lines, along with several gears of various sizes, representing a complex system or process. The overall theme is smart cities and sustainable technology.

**PROCESS / WASTEWATER
MANAGEMENT**

PROCESS WATER MANAGEMENT OVERVIEW

Process water management is the control and treatment of water used in various industrial processes.

- It is crucial for food processing, chemical production, and power generation.
- Process water is used for cooling, heating, cleaning, and dilution.
- Efficient management of process water is vital for resource conservation, cost savings, environmental protection, and regulatory compliance.

Steps in Process Water Management

- **Assessment:** Measures water usage, identifies sources, and analyzes quality.
- **Treatment:** Removes impurities through filtering, chemical treatment, and biological treatment.
- **Use and Reuse:** Reuses water within the process, such as closed-loop systems and stormwater capture.
- **Monitoring:** Regular testing and data analysis are used to track water usage trends and identify areas for improvement.
- **Reporting and Compliance:** Companies must keep records of their water usage and treatment processes to ensure compliance with regulations.



CONDITION AND REUSE OF PROCESSED AND WASTEWATER

Definition and Terminology of Wastewater

- Processed Water: Water treated to remove contaminants for reuse.
- Wastewater: Water adversely affected by anthropogenic influence.
- Conditioning: The process of treating wastewater to meet specific quality standards for its intended reuse.

Need for Reuse

- Resource Scarcity: Over-extraction, pollution, and climate change are causing freshwater sources to become scarce.
- Environmental Protection: Disposing untreated wastewater can lead to environmental degradation.
- Economic Efficiency: Reusing water can significantly reduce costs associated with water supply and treatment.





CONDITION AND REUSE OF PROCESSED AND WASTEWATER +

Classification of Wastewater Reuse

- Direct Reuse: Involves immediate use of treated wastewater without intermediate storage.
- Indirect Reuse: Treated wastewater is discharged into natural water bodies for further purification before extraction.
- Non-potable Reuse: Includes applications like landscape irrigation, industrial processes, and toilet flushing.
- Potable Reuse: Treated wastewater is upgraded to meet drinking water standards.

Treatment Technologies

- Primary Treatment: Physical processes to remove large solids and particulate matter.
- Secondary Treatment: Biological stage using microorganisms to decompose organic matter.
- Tertiary Treatment: Additional processes to remove remaining contaminants.
- Advanced Oxidation Processes (AOPs): Uses powerful oxidants to break down complex and toxic organic compounds.



COMPLIANCE WITH FEDERAL PROCESSING AND WASTEWATER REGULATIONS

Introduction to Federal Regulations

- The Environmental Protection Agency (EPA) oversees the management of wastewater and processing operations in the U.S.
- Key legislative acts include the Clean Water Act (CWA) in 1972, the Safe Drinking Water Act (SDWA), the Resource Conservation and Recovery Act (RCRA), and the Toxic Substances Control Act (TSCA).

Key Legislation Overview

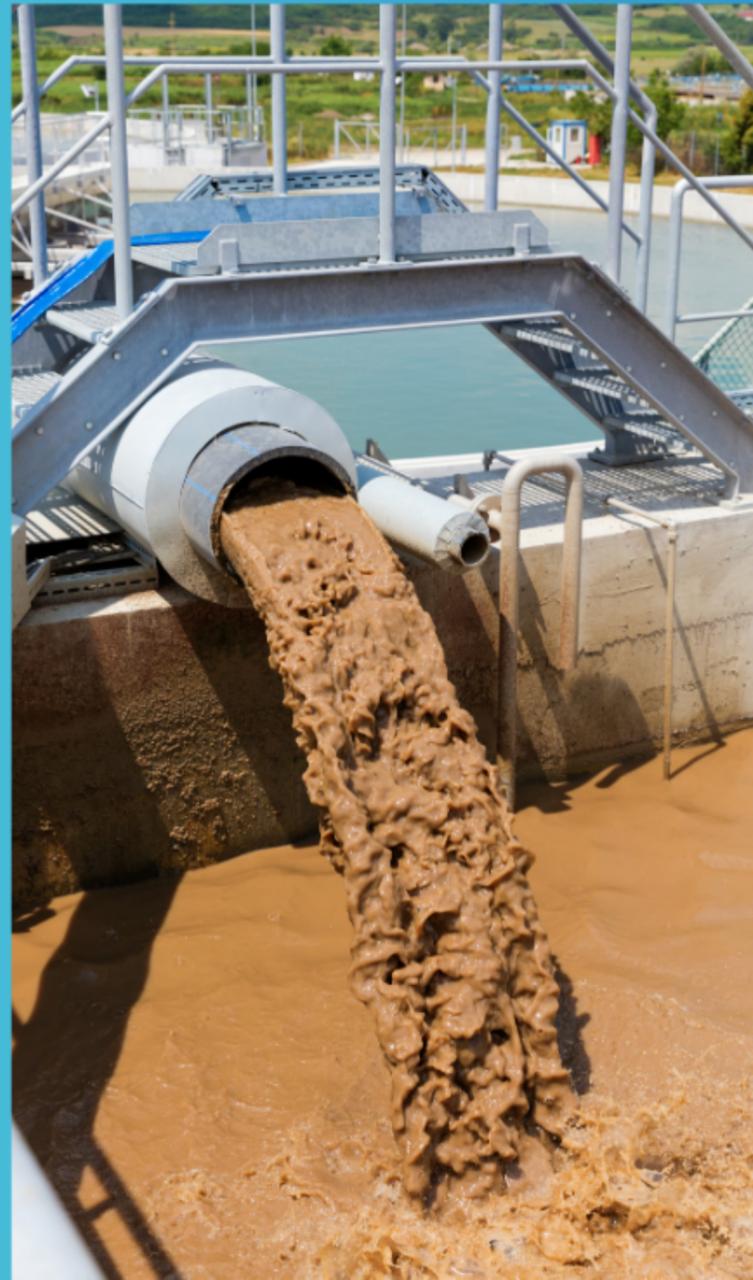
- The Clean Water Act (CWA) aims to prevent pollution and establish the National Pollutant Discharge Elimination System (NPDES).
- The SDWA protects drinking water quality and sets national standards for contaminants.
- The RCRA regulates the management of hazardous waste and emphasizes waste minimization and recycling.
- The TSCA regulates the introduction of new or existing chemicals and controls the discharge of toxic substances.



COMPLIANCE WITH FEDERAL PROCESSING AND WASTEWATER REGULATIONS +

Compliance Framework

- Permitting Requirements: Facilities must obtain an NPDES permit, monitor and report wastewater discharges, adopt Best Management Practices (BMPs), conduct compliance audits and inspections, and enforce regulations.
- Penalties for non-compliance include fines, mandatory compliance schedules, and criminal charges.
- Staying informed and proactive in compliance efforts is essential for sustainable industrial practices.





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THANK YOU

