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Portable Effluent Treatment Plant -A Review

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Abstract – *Biological waste is a significant source of pollution, which cannot be addressed by general effluent treatment plants (ETP). This waste has a lot of chemicals, biological and pathogens in its mix which can increase occurrences of disease outbreaks and newer phenomena of antibiotic resistant bacteria is increasing its effect on the society at large. This is important because contaminated wastewater discharged from hospitals poses numerous environmental risks. We are trying to figure it out harmful bacteria are hazardous living beings. We are trying to solve the problem of the toxic water change into regular use. Wastewater is generally inappropriately purified by hospital wastewater treatment plants and polluted effluents due to this; we are introducing portable effluent treatment plants (ETP) for the clinic.*

Keywords- ***Hospital waste water, bio medical waste, reuse.***

I - INTRODUCTION

Effluent Treatment Plant (ETP) is one type of waste water treatment method which is particularly designed to purify waste water for its reuse and its aim is to release safe water the environment from the harmful effect caused by the effluent. Wastewater contains a variety of impurities and a specific treatment technology known as ETP is therefore necessary. This project will be used to treat such waters that have been contaminated in some way by drug residue, hazardous chemical and microbial pathogens to make it safe for disposal to the environment and for reuse it. Reduce waste from water, prevent pollution of the natural environment, reduce water acquisition costs, clean up effluent and recycle it for other purposes.

II- LITRETURE REVIEW

P. Govind Asamy et al. [3] (2006) the research articles were reviewed to obtain background knowledge on this problem and to explore what has been done already. In JOURNAL OF ENVIIRON.SCIIENCE & ENGG., The name of report is Performance Evaluation of Common Effluent Treatment Plant for Tanneries at Pallavaram CETP. The study indicates that all major pollutants including odour were drastically reduced in the wastewater during the treatment process. With the increasing demand for leather and leather products, both for indigenous use as well as for export, large number of vegetable and chrome tanneries have mushroomed in India, especially in states like Tamil Nadu, Uttar Pradesh and West Bengal. Tannery wastewater is characterized by its strong color, high COD, high BOD, and TDS. The design of the CETP based for the flow of 3000 m3 /day and the treated effluent to meet the inland surface water discharge.

Pratibha Sharma et.al [5] (2014) International Journal of Advanced Biotechnology and Research (IJBR), with aim Efficiency Analysis of a Hospital Effluent Treatment Plant, in Reducing Genotoxicity and Cytotoxicity of Hospital Wastewaters was carried out by, Nupur Mathur, Anuradha Singh, Pradeep Bhatnagar. some of the substances found in wastewaters are genotoxic and are suspected to be a possible contributor to certain cancers observed in last decades. A properly designed Effluent Treatment Plant (ETP) is, therefore, a feasible solution to avoid hazardous consequences resulting from

discharge of untreated hospital wastewaters. Every anthropogenic activity generates some waste. Health care services are one among such anthropogenic activities wherein water quality is affected during the course of its use and wastewater is generated. Health-care wastewater is mainly liquid waste, containing some solids produced by humans (staff and patients) or during health-care-related processes, including cooking, cleaning and laundry. Depending upon such factors, the amount of waste water discharged from hospitals may vary from hospital to hospital but it has been estimated at 400 to 120 liters/bed/day.

Abdoliman Amouei Et al. [5] (2015) To study the parameters of ETP , 'Characteristics of Effluent Wastewater in Hospitals of Babol University of Medical Sciences, Babol, Iran' in 2015 were studied, They started to measure the parameters and The aim of this study was to determine the chemical indices, including pH, biochemical oxygen demand (BOD5), chemical oxygen demand (COD), total suspended solids (TSS), total kjeldahl nitrogen (TKN) and total phosphorous (TP), as well as chemical indices, including total coliforms (TC) and total heterotrophic bacteria counts (THBC), and heavy metals concentration of wastewater effluents from the hospitals of BUMS. The pH, TSS, BOD5, COD, TKN, TP, TC and THBC values are illustrated. These results indicated that the minimum, maximum and average pH of wastewater was 6.9, 8.3 and 7.6, respectively. The lowest, highest and average concentrations of BOD5 (161, 648 and 372 mg/L) and COD (379, 1187 and 687 mg/L) were identified for the hospitals studied. The minimum, maximum, and average TTS concentrations were 108, 538, and 289 mg/L, respectively, for the surveyed hospitals.

Shuhan Wen Et al. [7] (2018) On the site 'Scientific Reports' the report was published in 2018 the aim was 'Insight into the characteristics, removal, and toxicity of effluent organic matter from a pharmaceutical wastewater treatment plant during catalytic ozonation', founded out the impurities and resolved the problem. the potential risk to receiving waters and human health. Therefore, With the rapid growth of pharmaceutical needs, large quantities of wastewater containing products, raw materials, solvents and detergents from complex manufacturing processes are generated. Even conventional biological wastewater treatment facilities produce effluent organic matter (EfOM) with high chemical oxygen demand (COD), salinity, color, limited biodegradation, and toxicity, which increase, further EfOM removal during pharmaceutical wastewater treatment is an urgent need.

Nar Singh Chauhan Et al. [4] (2008). In Research article, the report was published with the aim Identification of genes conferring arsenic resistance to Escherichia coli from an effluent treatment plant sludge metagenomic library. Arsenic is one of the most toxic metals in the environment. Pollution of the environment by arsenic is increased through the use of geological sources and anthropological and industrial activities. Most bacteria evade cultivation in the laboratory. A metagenomics approach allows access to the genetic heritage of the entire bacterial community, regardless of culture. A metagenomics library has been constructed from an industrial effluent treatment plant sludge containing approximately 1.25 GB of microbial community DNA. A large fraction of bacteria in the environment remains unculturable by standard laboratory culture techniques Analysis of crop-independent microbial diversity revealed that non-cultivable bacteria belong to a range of phylogenetically diverse groups.

Rakesh Singh Asiwal Et al. [5] 2019, the report was published in International Journal of Scientific & Engineering Research. The aim was 'Analysis and Modification, on Effluent Treatment Plant A Case Study. Most of industrial Wastewater has high organic pollutant and are highly toxic These wastes are nuisance and are not soluble in water. This is biggest reason that most of the industries often reuses Waste water for more than one purpose. The existing solution for reuse or purification of Wastewater is Effluent Treatment Process, but it causes some issues while purification. Water is the largest natural resource in the world for any living environment. In most of the industries like paper industry, chemical, pharmaceutical water is used and it produces waste water. The wastewater from the pharmaceutical or chemical industry produces toxic and strong pollutants. Waste water is also known as influent.

Katariina M. M. Pärnänen Et al. [20] (2019) On the site of 'Science mirrors Advances' in, the research article was published with aim Antibiotic resistance in European wastewater treatment plants the pattern of clinical antibiotic resistance prevalence. Integrated monitoring of antibiotic resistance (IAR) is one of the objectives of the World Health Organization's global action plan on antimicrobial resistance. Antibiotic-resistant bacteria (ARB) can survive the inhibitory action of one or more antibiotics. These AOCs reduce the successful treatment of infectious diseases, resulting in

significant societal and economic costs to human well-being and health.

The aim of the study was to launch Europe's first surveillance of antibiotic resistance in WWTPs, in line with Objective 2 of the WHO Global Action Plan on Antimicrobial Resistance: "Strengthening knowledge. and evidence base through surveillance and research". This monitoring incorporates data from 30 European countries regarding invasive blood and spinal fluid isolates of Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa, Acinetobacter spp., streptococcus pneumoniae, Staphylococcus aureus and Enterococcus.

Roland Leclercq Et al. [5] (2013) this study is also important in the field of wastewater Treatment plant, the main aim this report is Changes in Enterococcal Populations and Related Antibiotic Resistance along a Medical Centre Wastewater Treatment Plant-River Continuum .To determine if hospital effluent input has an ecological impact on downstream aquatic environment, antibiotic resistance in Enterococcus spp. along a continuum medical centre-retirement house-sewage treatment plant-river in France was determined using a culture-based method.. Enterococci are Gram-positive, opportunistic bacteria that inhabit the gastrointestinal tracts of humans and many animals. This report was published by Applied and Environmental Microbiology. In the result Water contamination by enterococci was investigated along the hospital-retirement home-WWTP-river continuum and provided resistance to antibiotics in enterococci.

Dr. Nihal Anwar Siddiqui Et al. [5] Identification of sources of Wastewater, its characterization and quantification in hospitals, by Department of Health, Safety & Environment University of Petroleum & Energy Studies. The aim of this project is to study the characteristics of wastewater from the hospitals in Dehradun, by determining the pH, Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD5), Chemical Oxygen demand (COD), total suspended solids (TSS), total dissolved solids (TDS), turbidity, alkalinity, heavy metal concentration (Pb, Cu, Cd) from hospital wastewater treatment effluents and tributaries hospital wastewater treatment plant (WWTP) . and composite samples of the effluent if no WWTP is available. The samples for the characterization of the ingredients will be collected from the following major hospitals of Dehradun. The bed capacity for these hospitals ranges from 25 to 1000 beds. The samples collection will be performed at field conditions. Samples collected will be analyzed in accordance with the APHA "Standard Methods for the Examination of Water and Wastewater" in the NABL-certified Health Safety Environment Lab at UPES, Dehradun.

Bileen Wolmarans* and Gideon H de Villiers (2002) has published a paper on Start-up of a UASB effluent treatment plant on distillery wastewater. A distillery in Wellington in South Africa uses the raw material for grape wine. (During grape-growing season) which is fermented and then distilled. segregate the alcohol from the fermented liquid. The resulting effluent stream is highly contaminated by a chemical

Oxygen demand (COD) is 20,000–30,000 mg/l and pH are low between 3 and 4. These figures are comparable to those of other grapes. Wine-based distillery effluents with COD values ranging from 22,000 to 48,000 mg/l.

Feng Ju Et al. [8] (2018) research on the project of Wastewater treatment plant resistomes are shaped by bacterial composition, genetic exchange, and upregulated expression in the effluent microbiomes, The significance of wastewater treatment plants (WWTP) both as a barrier to bacterial resistance and as a potential hot point for diffusion have been emphasized, though risk assessment to human health is still unresolved Gene inventories of microbiomes were built from influent, bioreactor, and effluent metagenomes of 12 communal WWTPs.. The potency of metagenomics and bioinformatics has been demonstrated in the exploration of the diversity of ARGs in the environment.

Desai P. A. and Kore V. S has assessed Performance Evaluation of Effluent Treatment Plant for Textile Industry in Kolhapur of Maharashtra, the textile industry is one of the main sectors of India's economy, accounting for almost 14 per cent of total industrial output. Effluents that have elevated BOD and COD concentrations are highly toxic to biological life. High alkalinity and chromium tracks, which is used in dyes negatively affect aquatic life and also interfere with biological treatment processes. It has been documented that the residual color is generally caused by insoluble dyes that have low biodegradability as reactive blue 21, direct blue 80 and vat violet with ratio of COD/BOD 59.0, 17.7 and 10.8 respectively.

Sasan Kordrostamion (2015) published conference paper where they designed the Waste-water treatment plant: Design with a purpose to make water quality better for drinking and other puposes. They design the grit

chamber, Equalization basin, Primary sedimentation, F/M ratio, Return sludge flow rate, Secondary settling tank. Some design calculations have been carried out using Excel software, therefore it is advisable to use these software for ease of calculation.

Shuokr Qarani Aziz and Jwan Sabah Mustafa (2019), The purpose of this work was to assess the water demand of a specific community and present the design and calculations to meet the requirements of the ETS units. The WTP design was applied to the Greater Zab River water for the selected site in Erbil City-Iraq. A standard step-by-step design for WTP units was introduced. Procedures, detailed calculations and drawings were depicted. Average discharges of 60000 m^3/day and a population of 200000 inhabitants were used in the design of the ETP. The quality and quantity of the surface water supply influenced the design of the WTP.

III - CONCLUSION

This review paper was done for the research on portable ETP, but the review paper focused on the performance of the ETP, Analysis of the efficiency of the ETP. Some are on the reduction of the parameter of the toxic effluent of the pharmaceutical water and on identifying E. coli genes, and very few reports on ETP design, so based on all the reports here, it is concluded that the portable ETP was not fabricated.

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