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Environmental Impact Assessment in pulp and paper industry

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Abstract : Pulp and paper industry is the huge consumer of water among various industries also controls the pollution by proper wastewater treatment methods. All mills should utilize and treat the water based on Indian standards and release the effluent as per environmental permits. Nowadays most of the industries move towards the quality and improvement in waste treatment in their own industries premises. Industries were aware about the impacts created by untreated or not properly treated waste and also this work focus to assess the water foot printing tools and water disclosure as a key initiative. This research work focus towards the effective water usage, quality treatment to reduce the impact on environment also specific site problem and suggestions to overcome the issues globally.

Keywords : Pulp and paper industry, environmental permits, impacts.

Status of Water In Tamilnadu

State framework for water resource management plan of Tamilnadu was prepared by Water Resources Organization. The yearly water probable of the State for surface and groundwater is evaluated as 46,540 MCM (1643 TMC) although the anticipated demand is 54,395 MCM (1921 TMC) in 2001 which is expected to go up to 57,725 MCM in 2050. The identified segments where the water demand may increase such as domestic use is due to raise in population and urbanization from 4 % to 6%, agriculture use may remain same or diminish due to urbanization, industrial use may amplify about 27.7%.Water resource planning was made effectively to manage the water bodies for ecological purposes.

Water Use in Paper Industry

Water is utilized in all major and minor process/practicephases, including preparation of raw materials (pulping and bleaching) and in paper machines (pulp slurry dilution and fabric showers) etc. Water is also used in cooling towers, transportation of materials, equipment cleaning, general operations, and to produce steam for thermal and mechanical processes as well as on-site electricity generation. Overall intake water has been reduced yearlyduringdifferentmanagement efforts. Our 2013 water usage was reduced compared to 2009 by 9.9%(NRC 1994).

Source of Waste Water

Most of the organic chemicals were used and generated from paper industries and other industries such as pesticides, pharmaceuticals, paints and dyes, petrochemicals, detergents, plastics etc. Waste waters generated in huge level with variety of byproducts and the treatment facilities opt for industries specially in paper industry were shown importance.

Biological Treatment

Aerobic Treatment

Aerobic treatment is the popular and common treatment which utilizes microbes and based on the metabolic activity the process shows its efficiency. External aeration is provided for the growth of microbes by aeration equipment. Various aerobic treatment systems are available based on the level of pollution, space availability, fund allotted and climatic condition for treatment the treatment process was selected.

Anaerobic Treatment

Anaerobic treatment is very suitable for treatment of high strength wastewaters such as COD, BOD etc. this treatment is not very popular in paper and pulp industry wastewater but for high pollution loaded wastewater this treatment is considered as best suitable one (Ochre-Media, 2001). Many researches were carried out in anaerobic process to overcome aerobic treatment to attain efficiency, sludge production, space, chemicals usage and energy production more than aerobic process (Person, 2011). The main trouble with execution of anaerobic treatment in pulp and paper industry effluents is the possibility for formation of hydrogen sulphide; considering sulphate is extensively used as energetic chemical in many pulp and paper mills. An additional significant concern with an anaerobic process is its sensitivity to toxic compounds present in the paper industry wastewater (Thompson et al., 2001).

The anaerobic digestion process absorbs biological alteration in a step-wise manner, of organic material to different end products as well as methane and carbon dioxide. The process offers numerous advantages and inconvenience over other treatment methods such as aerobic process. A well handled anaerobic digestion process has the capability to generate maximum methane creation, and will not release any gases to the atmosphere. This process will also supply a resource of energy with no net increase in atmospheric carbon which gives to climate change. Energy generated in the form of biogas through the anaerobic digestion process can assist to diminish the demand for fossil fuels.

Recycling of Waste Water

Reducing Water Consumption

The water consumption of a paper or board mill can be reduced by tightening the water system of the mill. This has the advantage that lower levels of suspended solids, suitable for paper raw material are discharged to drain. With less fresh water being introduced to the system, the temperature of the white water rises, which makes it easier to remove water from the paper web, so that energy can be saved. Increased tightening of the white water system, however, causes some problems in paper and board mills, preventing total closure of the water circulation system. The accumulation of salts and organic compounds dissolved from the fiber raw material increases significantly, which causes problems due to microbiological activity, corrosion and growth of slime, which must be controlled.

Reuse of Water

White water from the paper or board machine may be first treated mechanically by flotation, sedimentation or filtration, or a combination of processes. The flotation treatment is suited to the recovery of fine suspended solids. Sedimentation is better suited to white waters that contain large amounts of filler. Filtration is suitable for white waters that contain low levels of solids and filler. Generally, the brown grades of paper are most tolerant of recycled water, followed by newsprint and tissue types. Fine papers (high whiteness) are very sensitive to color and certain metal ions, particularly with respect to aging and coloring. The colloidal chemistry involving paper sizing and resin applications is sensitive to phosphate and other dispersants and some metal ions.

Conclusion

Worldwide water utilization becoming very significant concern and also energy generation from waste become emerging technology. 4R system was implemented in many industries and cities to reduce the damage to environment. The majority widespread practical systems are biological treatment, sequential anaerobic and

aerobic systems, followed after primary treatment were implemented in industries. Nevertheless, the wastewater treatment has stands first and vital approach. The preeminent accessible treatment technology for all three waste stages depends on the manufacture processes, raw materials and the regulations, which the industries have to act upon.

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