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A Review on Contract Management on Sewage Treatment Plant (STP)

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ABSTRACT

A study on domestic waste water characterization has been performed followed by the design of sewage treatment plant. The present study involves the analysis of pH value, total solids, total suspended solids, hardness, acidity, alkalinity, chloride, chlorine, BOD, DO and heavy metals such as Iron, Copper, Zinc, Magnesium, Nickel, Chromium, Lead, Calcium, Aluminium, Silicon, Potassium. A sewage treatment plant is quite necessary to receive the domestic and commercial waste and removes the materials which pose harm for general public. Its objective is to produce an environmentally-safe fluid waste stream (or treated effluent) and a solid waste (or treated sludge) suitable for disposal or reuse (usually as farm fertilizer).

The samplings of the domestic waste from hostels have been done in different times of the day to have an average data of the measured parameters. The average values of pH, Turbidity, Acidity, Chloride, Residual Chlorine, Hardness, Total Solid, BOD, DO, Alkalinity, Total Iron Content, Zinc Content, Potassium, Copper, Magnesium, Nickel, Chromium, Lead, Calcium, Aluminum and Silicon are found out.

The study examined the use of contract management practices on performance of the Sewage Treatment Plant construction projects, implemented under different contract modes. The objectives of this presentation are to examine the role of monitoring intensity in enhancing performance of the Sewage Treatment Plant construction projects under contract modes Item Rate, BOT, EPC, HAM, TOT etc. to analyze the relationship between risk management and performance of the Sewage Treatment Plant construction projects and to assess the role of evaluation in enhancing performance at different parts of the country.

Good contract management and administration has the capacity to increase revenue opportunities, decrease costs and enhance service delivery. Importantly, as competencies of managers and resources at their disposal increases, it is essential that they strengthen their efforts to make compliance central to strategic objectives.

Many findings including and indicated that there was a significant positive relationship between monitoring intensity, risk management, evaluation and performance of STP construction projects. The performance of the STP construction projects in India was more related to the availability and use of resources which include funding, human resources and the basic raw materials used in the construction process which results into delays, cost overruns and poor quality service. Based on these study findings it is therefore recommended that India should commit more resources to evaluation and risk management to realize higher level of service delivery in Sewerage construction/ STP. My above presentation covers briefly number of risks encountered from different contract modes of Sewer projects.

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1. INTRODUCTION

Pollution in its broadest sense includes all changes that curtail natural utility and exert deleterious effect on life. The crisis triggered by the rapidly growing population and industrialization with the resultant degradation of the environment causes a grave threat to the quality of life. Degradation of water quality is the unfavorable alteration of the physical, chemical and biological properties of water that prevents domestic, commercial, industrial, agricultural, recreational and other beneficial uses of water. Sewage and sewage effluents are the major sources of water pollution. Sewage is mainly composed of human fecal material, domestic wastes including wash-water and industrial wastes.

The growing environmental pollution needs for decontaminating waste water result in the study of characterization of waste water, especially domestic sewage.

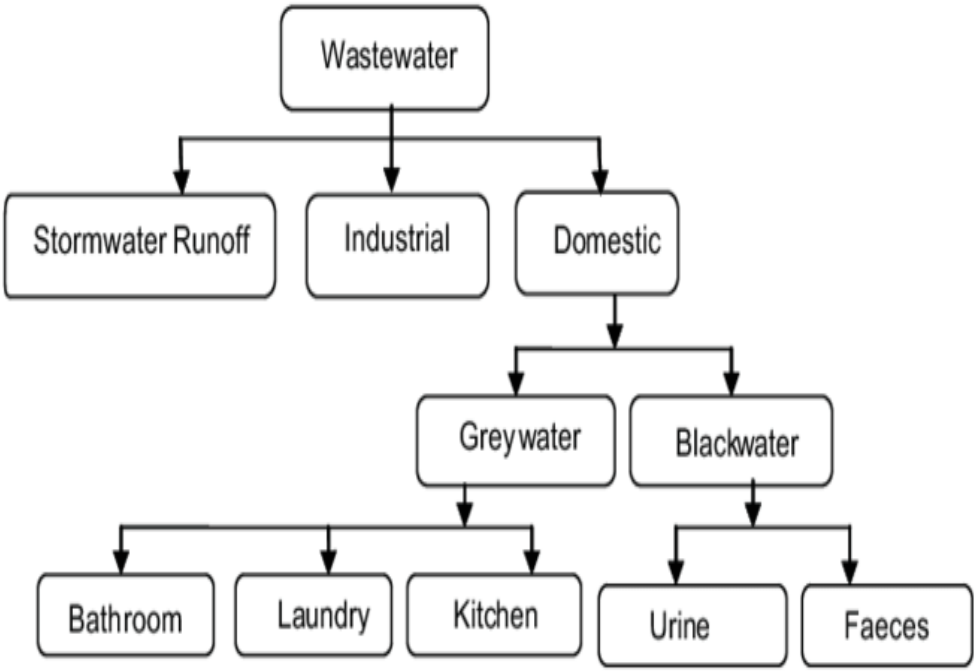
In the past, domestic waste water treatment was mainly confined to organic carbon removal. Recently, increasing pollution in the waste water leads to developing and implementing new treatment techniques to control nitrogen and other priority pollutants.

Sewage Treatment Plant is a facility designed to receive the waste from domestic, commercial and industrial sources and to remove materials that damage water quality and compromise public health and safety when discharged into water receiving systems. It includes physical, chemical, and biological processes to remove various contaminants depending on its constituents. Using advanced technology it is now possible to re-use sewage effluent for drinking water.

The present study comprises the study on quality of domestic waste water that is discharged from the HB Hall of National Institute of Technology, Rourkela, through the kitchen outlets and bathroom effluents. The study includes characterization tests for pH value, acidity, alkalinity, chloride, residual chlorine, turbidity & DO.

1.1. Types of wastewater:-

Wastewater can be described as in the figure below.



1.2. Objectives of the study:

The principal objective of waste water treatment is generally to allow human and industrial effluents to be disposed of without danger to human health or unacceptable damage to the natural environment. An environmentally-safe fluid waste stream is produced. No danger to human health or unacceptable damage to the natural environment is expected. Sewage includes household waste liquid from toilets, baths, showers, kitchens, sinks and so forth that is disposed of via sewers. Sewage also includes liquid waste from industry and commerce.

The objectives of the study are:

1. Physical, chemical and biological characterization of the domestic waste water STP-JJR-Jhajjar-5 MLD
2. Comparison with the prescribed standard
3. Design of the sewage treatment plant.

For determination of inorganic non-metallic constituents we determined the:

A. Alkalinity
B. Acidity
C. Chloride
D. Residual Chlorine
E. Sulphate
F. Ph. of the sample
G. Biochemical Oxygen Demand
H. Dissolved Oxygen

1.3. Water Pollution Sources

➢ **Point sources**

- Discharges at specific locations
- Easier to identify, monitor, regulate

➢ **Non point sources**

- Broad, diffuse areas
- Runoff of chemicals and sediment
- Agriculture
- Control is difficult and expensive

Point Sources

➢ Some point sources of water pollution include

- Waste products from factories
- Waste from sewage system
- Waste from power plants
- Waste from underground coalmines
- Waste from oil wells

➢ They are called point sources because they are direct sources of water pollution and can be reduced and monitored

Non-point Sources

➢ The term non-point source encompasses a large range of sources such as:

- When rain or snow moves through the ground and picks up pollutants as it moves towards a major body of water.
- The run off fertilizers from farm animals and crop land.
- Air pollutants getting washed or deposited to earth.
- Strom water drainage from lawns, parking lots, and streets.

LITERATURE REVIEW

Faqir S. Bagi (2016), according to him when water/sewer facilities are built to provide safe drinking water which will reduce health related risk, this will benefits existing businesses and also helps to attract new businesses to the community. Further it will enable to generate private investment, public fund and increase the property tax base, through these expansions and increasing of businesses activities will increase the local income and it will add to the local property tax bases, sales tax revenue and even local income tax revenue will also increase.

Jie Jiang (2018), ecological protection tax imposed to pollution behaviors and ecological tax includes pollution tax is directly associated with actual pollution values, pollution tax or material tax is indirectly imposed on those product through which it produce pollution in the production process. The implementation of tax difference such as low tax rate for the beneficial ecological products and high tax rate for those products which will harm the ecology

James Boyd (2016) a tax based policy and a command-and-control quantity standard can both achieve the efficient outcome. The economists have compared two broad types of policy, they are Charges and standards approach and a uniform treatment approach. Under charge approach, a uniform tax is applied to a set of polluters, with the tax level set high as much as necessary to encourage aggregate effluent reductions adequate to meet an ambient water quality standard were as in uniform treatment approach, all firms are required to trim down their emissions by an equal percentage, sufficient to meet an ambient standard

Anand Bhansali et. al. (2017), the treatment of municipal wastewater was the rational for the subsidies, the newly constructed publicly owned treatment works (POTWs) became heavily involved in processing industrial effluents. The consequence of this was the tax money drawn national wide subsidized industrial waste treatment. Water using industries increased their use of POTWs during the subsidy period and when charges and other restriction were imposed during that time their discharge will decreased marginally. In other word water intake increased with use of POTWs and decrease with the pollution legislation

John C. Whitehead (2016) the effect of changes in prices, quality and income on willingness to pay for quality change was examined. The comparative study was done between resources users and resources non-users. The empirical measures of willingness to pay for quality changes will vary inversely with the own price for resources users and for resources non-users, the willingness to pay will vary inversely with the own price if the quality improvement leads to resource use. No effect will be found for nonusers if the improvement doses not lead to resources use. The cross-price and its potential effect were shown by identify the substitution and complementary relationship between trips to natural resource sites.

Mirajul Haq, et. al. (2018), Safe drinking water is an effective health measure to prevent or reduces the mortality caused owing to water-born diseases. Scarce drinking water not only resulted in more sickness and deaths; however it will also enhance health cost, lower worker productivity and school enrolment. The willingness to pay (WTP) for improved water service and prevention of the behaviour for the quality improvement of drinking water and by applying contingent valuation (CV) method for estimating the economic value of non-marketing environmental goods. The WTP depends on income, wealth; household education level will determine the WTP. The economic effect of unsafe drinking water include changes in the expenditures pattern and well being in terms of medical costs, earning lost, lost production in the household, loss of leisure time and so on.

Jon D. Harford (2017) focused that the issues of childbearing choices and externality in a two – generation model of a competitive economic with a pollution externality is twisted with the aggregate consumption of one of two goods, is based on population growth and their external effect. The externality is understood as a pollution interpretation

Trenery Dolbear F (2016) indicates the conventional assumption of price theory, that some qualification to the usual classroom externality prescription are necessary and it is notwithstanding. He has sympathy for Pigovian tax subsidy policy. Pauly's suggestion was similar to his idea "it is not in general possible to impose a per unit tax which will simultaneously compensate for damage and achieve a Pareto optimum". He preferred to show the result that can be achieved with a "per unit tax". But Pauly is minded with "increasing per unit tax". The average as well as the total tax depends on the quantity consumed.

CONCLUSIONS

1. The waste water have high BOD, Turbidity and total dissolved solids. Our aim is to make this water safe for disposal in natural environment or to use it for other purposes.
2. The DO content of waste water recorded is found to be low value due to the presence of higher organic matter and an increased BOD and COD.
3. This increased BOD and COD value indicate the polluted nature of the discharge. We've to treat it at least below to 20ppm.
4. Higher quantity of of inorganic nutrients like nitrogen & phosphors was found present in the waste water.
5. The waste water has a range of 7.5 – 8.5.
6. Most Probable Number value was higher again indicating the polluted nature of the waste water.
7. Disposal without any treatment in to fresh water body may impose the danger of eutrophication as well as serious problems of health and hygienic.
8. Long term leaching of waste water may alter the soil characteristics as well as may influence the quality of ground water.
9. The treated wastewater can be utilized for purposes like gardening, washing vehicles and cleaning garages, etc.

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