



**FINAL YEAR PROJECT REPORT
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**IRON REMOVAL
BY
INTERMITTENT COAL ASH FILTRATION**

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ABSTRACT

Using coal ash as filter media, a series of test will carried out on waters of high iron concentration level. The dosage will be given intermittently. The efficiencies of such method will be analysed and to be compared with other filter media like sand. The effect of various parameters affecting the removal, such as bed depth, initial concentration of solute, pH etc will be determined. The water quality parameters will be analysed in the influent and effluent waters. It was found dosage time of 9 hours with an interval of 2 days each, gave better performance compared with the 6 and 3 hours dosing time. The pH value of the effluent increased with the existence of hydroxida ion in the media. Intermittent filtration can contribute as an 'aeration' in filter system whereby increasing the filter performance.

1.0 INTRODUCTION.

1.1 General

Iron is a common water contaminant. Water is necessary for every individual on earth. As far as drinking water is concerned it should be sufficient and measured up to the standard laid down by World Health Organisation (W.H.O.) (*refer Appendix A3*). The physico-chemical and metal ion impurities in drinking water may either be from the earth's crust or from surroundings. The impurities from earth crust are mostly metal ions like iron, lead, manganese and other ions which varies from place to place. Iron may present in the core of the earth, industrial waste, mine drainage and municipal drainage.

Iron may present in water as ferrous or ferric state. In a reducing environment, ferrous is relatively soluble. An increase in oxidation-reduction potential and pH of water readily converts ferrous ion to ferric ion. Ferric ion hydrolyzes and precipitates as hydrated ferric oxide or $Fe(OH)_3$.



Dissolved iron in excess of 0.3mg/l is not harmful but it can cause undesirable taste and odour, orange stain to laundry article, utensils, textiles, paper and plumbing fixtures in water system. W.H.O. has set 0.1mg/l as the maximum permissible limit for iron in drinking water and 1.0mg/l as the maximum permissible limit in water intended for domestic use.