A DISCUSSION OUTLINING FILTRATION OF HORTICULTURAL WATER FROM INFLUENT TO EFFLUENT.

Since the beginning of time mankind has found it difficult to manage it's natural resources primarily due to economic pressures, greed and power. It is evident from increased population and usage of water like never before that the Worlds potable water resources are slowly being depleted due to, extraction, waste, over usage, and contamination.

As we entered the Twenty First Century more awareness is now given to protecting our natural water aquifers from contamination due to the degradation of our natural water table from industrial waste in many sectors of industry right across the board.

Environmental responsibilities coupled with Government legislation has encouraged all industrial sectors to look at new ways to treat industrial waste water.

Some industrial sectors such as the horticultural flower growing industry use huge amounts of water which creates a cocktail waste effluent which can contain harmful pesticides, fertilisers, and bacteria. Up until the late 90's this effluent was literally looked upon as run off and was disposed of in local water ways, and sometimes even main drain or storm interceptors which eventually finds its way into the water table.

In some modernised countries legislation was passed to try and prevent the disposal of effluent run off into local water ways, streams and rivers. This presented two immediate problems, economics, and practicality.

Legislation tends to go hand in hand with the capital expenditure needed to solve the problem. This could either be done by effluent storage and collection disposal of by Government, or alternatively, the effluent could be treated by new novel sterilisation and filtration systems and returned for re-use at the primary filtration plant.

The design of a primary filtration plant is an important aspect of the recirculation of treated run off water as the system has to accommodate a number of variables, it may consist of a number of different treatment techniques adapted to suite the influent water characteristics.

Influent water can come from a number of different sources, however, due to economics an industrial sector may find state mains to expensive or non existent, shallow well's do not recover fast enough, and rainfall reservoirs are depleted faster due to changing weather cycles. Uncertainty in weather patterns along with tighter enforcement notices restrict the use of available water.

To this point the growing sector drill deep boreholes in search of water but in certain areas the majority of the time most boreholes drilled and tested have high levels of sodium which is unacceptable for growing flowers such as roses. Therefore the design parameters of the primary filtration system must be able to handle the filtration of sodium at an acceptable cost.

Research and development work indicates that innovative filtration techniques with reverse technology which exchange sodium for a plant nutrient source can be a very viable option indeed,compared to other recognised systems which are energy hungry.

A nutrient exchange system can act as a stand alone filtration system or it can be incorporated and enhance other traditional filtration methods required to treat the influent water at the primary filtration point. Unlike other systems a nutrient exchanger produces waste which can be used to fertilise areas such as grass in arid areas around the industrial complex. For a nutrient exchange technique to work correctly a careful balance of the incoming water is a critical factor in removing sodium to a acceptable level.

A filtration system which initially filters and then re-mineralises will reduce fertiliser cost thus enabling a sufficient saving to be made that such a system can be affordable.

An important aspect of a primary filtration plant in an agricultural environment is to handle the recirculated run off water returned from the irrigation system which requires special sterilisation and filtration.

Attention must be given to filtration waste water which can contain a multitude of contaminates which have to be disposed of in accordance with local regulations. New technology is currently being developed to cost effectively recover half of the waste produced from filtration plants. Bacteriologically absorbent materials and electrolyse systems are an option coupled with ion exchange technology.

A certain amount of waste effluent is sometimes typically collected by a local Government department responsible and working under the department which issues waste water regulations and legislation.

Alternately in developed countries waste management companies exist which charge for effluent disposal.

It is apparent from new innovations developed by the water treatment industry has enabled the growing industry to comply with regulations, as systems nowadays are now economically viable. Practical, options also now exist which can only improve as new materials such as Graphene enter the market place.

More so it has decreased the environmental impact that industrial waste water has on our fragile eco systems which exist in our water ways, we must leave clean water for future generation to come.