

Technical Discussion #3

BIO-AUGMENTATION FOR WASTE WATER TREATMENT

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Custom Biologicals, Inc. (CBI), located in Deerfield Beach, Florida, USA, manufactures bacteria and biological products. CBI specializes in high volume production techniques of bacteria. One of CBI's most successful products is Custom WP, which is used as a biological additive for established waste water treatment plants, or, as a unique biological treatment system for alternative waste water treatment in developing countries.

ESTABLISHED WASTE WATER TREATMENT PLANTS

The problem with some waste water treatment plants is that they are either over-loaded or they are obsolete before their construction is completed. CBI's microbiologist, Dr. Clarence L. Baugh analyzes waste water treatment problems by isolating the bacteria working in a treatment plant, not by enlarging the overall capacity of the plant. Waste water research scientists estimate that 5-10% of the existing bacteria in a sewage treatment plant contribute to the sewage treatment process. The other bacteria compete for the available oxygen and nutrients. CBI specifically selected the bacteria in our product Custom WP to increase the percentage of these "worker bacteria" within the treatment plant, thereby increasing the overall results from the plant.

Custom WP is a live synergistic blend of natural, Class I bacteria, specifically chosen for their ability to rapidly degrade solids, fats, lipids, protein, detergents, hydrocarbons, and other compounds. These compounds either overload a treatment plant or are toxic to the waste water treatment system. Custom WP is added at between five and fifty parts-per-million and is completely safe to humans, animals and plants. Custom WP is appropriate for all types of domestic treatment plants and has been shown to greatly reduce BOD and suspended solids.

The most striking results have been the reduction of sludge and the rapid degradation of fats, oils, and greases in the waste water treatment system. An example: a treatment plant in the country of Ireland had a monthly average BOD of 380 milligrams-per-liter before treatment. This BOD was reduced to 24 milligrams-per-liter which equals a reduction of 94%. In addition, the amount of oxygen required to run the plant was reduced by 35%. These are considered exceptional results. In addition, Custom WP has had exceptionally good results in waste water treatment plants that have been negatively affected by "shocking" from industrial areas.

Custom WP helps to control odor in the waste water treatment plant. Odor is produced by bacterial decomposition of organic material, because indigenous bacteria do not completely degrade organic compounds such as proteins, carbohydrates, and starches. Among the chemicals that cause these bad odors are hydrogen sulfide, organic sulfur compounds, organic acids and amines.

The microorganisms in Custom WP utilize essentially all of the available organic material and oxidize it to carbon dioxide and water. Working on a competitive principle, selected microorganisms are added at approximately one million times the concentration of the indigenous bacteria. The indigenous bacteria are so outnumbered that they can not successfully compete for available organic material. This greatly restricts their growth and also greatly diminishes the emission of organic compounds that produce the characteristic odor. The small amount of incompletely oxidized organic material that they may produce is quickly utilized by the microorganisms in Custom WP, further reducing the odor.

ALTERNATIVE WASTE WATER TREATMENT SYSTEMS

In developing countries and rural areas, very simple systems can be designed to compliment the enhanced biological activity of Custom WP. With bio-augmentation and very simple physical systems, the quality of waste water can be greatly enhanced without the overwhelming cost of new treatment plant construction. Previously contaminated rivers and streams can be quickly rejuvenated with Custom WP. In many cases these natural bodies of water can be converted into effective treatment facilities by continuous bio-augmentation with the Custom WP waste water treatment system.

Other examples of small waste water treatment systems which can be greatly enhanced with the Custom WP waste water treatment system are: facultative lagoons, and aerobic or aerated lagoons.

Facultative lagoons are systems that are low-cost and, with Custom WP, highly efficient alternatives for waste water treatment, especially in tropical and subtropical climates. When bio-augmented with the Custom WP waste water treatment system, BOD reductions of 95% can be expected for raw screened or primary settled domestic waste waters.

Aerobic or Aerated lagoons can also be bio-augmented with Custom WP. These lagoons can be smaller in size or can accept higher loading. In the past, abnormal operation occurred when the lagoons were overloaded or when a toxic chemical was released into the lagoon. However, the addition of Custom WP can return the lagoon to proper operation. Also, when bio-augmented with Custom WP, these lagoons can be used as a post-treatment for facultative and anaerobic lagoons.

Custom WP can also be used for bio-augmentation during land application of sewage or sludge and can be used for the removal of ammonia and phosphate from waste water.