

Ask Tom! Column

Bio-Activation in Wastewater and Collection Systems

Guest article by Scott Windham of Natural Resource Protection Inc

Domestic sewage has been a problem since long before the development of the modern wastewater collection and treatment systems that are taken for granted in the developed world of today. The earliest cities of ancient Greece and Rome established the need for the proper disposal of its domestic wastewater, not only for the odor problem but they recognized the health hazard present in “foul smelling bodily fluids” as it related to “the sicknesses” that they observed when the waste water contaminated food and drinking water wells. Their solution was collection and relocation, usually to a nearby stream or river which would carry the wastewater away.



Until the discovery of microorganisms and their relationship to disease there was virtually no sewerage treatment methods employed for the disposal of the domestic wastewater from any major city other than collection and relocation. It took a major epidemic in London in the eighteenth century that was traced to the sewage collection system to be the stimulus for the development of the treatment systems that we employ today.

The technology of sewage treatment has evolved very slowly over the last hundred years and even though most engineers and wastewater experts are aware of the biological nature of the product the major efforts to increase the efficiency of the treatment system and to eliminate odors, fats, greases, oils and to reduce the volume of sludge have centered around physical and not biological improvement.

Natural Resource Protection Inc. (NRP) studied the total biological treatment problem with regard to reducing odor, fats, grease, oil and the lowering of total sludge volume through enhancing the biological activity of the indigenous microorganisms. This resulted in the development of an enzyme-based product called BioKat.



NRP's "down the manhole" dosing unit

BioKat is a complex formulation that increases the cellular metabolism of the bacterial microorganisms present in the wastewater. It functions by supplying the missing or deficient intercellular micro enzymes that are lacking in the nutrient constituent of the wastewater.

The nutrients present in the wastewater are derived from the end product of the digestive process of the people using the wastewater system. These nutrients (wastes) have already gone through a biological digestive treatment in the human body whereby the body has extracted the nutrients that were subject to the human digestive tract and are deficient in many biochemical components.

Many of these components are amino acids, proteins, vitamins and enzymes. Thus the wastewater stream can be considered to be deficient or lacking in many of the nutrients and micro nutrients that would be required by many beneficial microorganism that we rely on to further process (digest) the waste nutrients.

The inefficiency of the beneficial microorganisms due to this lack of essential balance of micronutrients can lead to an imbalance in the micro flora and lead to increases in odor production, undigested FOG (fats, grease and oil) , and higher solids in the wastewater stream leading to higher sludge volume.

BioKat is a product that when added to the wastewater will supply many of the missing micronutrients and intracellular enzymes that are required for the microorganisms to function at their highest metabolic rate.

Achieving the highest metabolic rate possible within the collection system and plant assures that the plant efficiency is operating at its maximum throughput and with the highest degree of nutrient conversion (digestion). This increase in nutrient consumption by its very nature reduces the solids loading, decreases the FOG and reduces the odor. The metabolic process of aerobic microorganisms results in three major events,

1. Consumption of nutrients
2. Production of carbon dioxide gas and
3. Generation of energy (heat).



There is also, as the end result of this process, an increase in the number of microorganisms (biomass increase) as the microorganisms go through log phase growth and reproduction. The theoretical conversion of nutrients to new biomass in a typical bacterial life cycle is 1/3 goes to CO₂ production, 1/3 goes to energy production and the remaining 1/3 is new biomass.

From this it is evident that if the microorganisms can be activated to achieve their full metabolic rate then there will be a greater consumption of nutrients with a corresponding reduction in solids volume. Additionally, as the beneficial microorganisms out compete the less desirable microorganisms for the available nutrients the ability of these other microorganisms to thrive is diminished thus reducing their ability to create the problems of odor and H₂S gas and corrosive acids.

Activation of the indigenous bacterial flora by the use of BioKat allows the WWTP to achieve its optimal level of efficiency. This may reduce energy costs, chemical additive costs and reduce maintenance problems while postponing the need for capital expansion. BioKat Cellular Activator is an all natural non-toxic product that acts at the biological level of the WWTP and improves efficiency of the biological process and improves overall water quality of the plant.

About our author:

For more information contact our author at:

Mr. Scott Windham
Natural Resource Protection Inc.
2948 NW 60th St.
Ft. Lauderdale, FL 33309
Telephone: 954-970-7773 or toll free 888-633-3444
Fax: 954-970-7778
Email: swindham@nrp-inc.com
Web site: <http://www.nrp-inc.com/>

+++++

Welcome to Ask Tom!, a monthly column by our resident water treatment guru, Tom Keenan of National Environmental Services Agency (NESAs). Tom addresses the issues that bug you the most. And Tom knows!! With 35 years experience in providing environmental support services to public and private sector clients on a wide range of environmental issues.

Help others by posting your comments, suggestions and experiences with water or wastewater treatment or any other concerns you may have on our On-Line Help Forum. For past **Ask Tom!** Articles, visit the **Ask Tom! Archive**.

Guest articles for the **Ask Tom!** Column are always welcome, for more information please contact Tom Keenan directly at his email address: info@nesa.ie

© Water and Wastewater.com