

Px700- Biostimulation

The *Cutting* Edge of Technology for Wastewater

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INTRODUCTION

Bio-Stimulation is the introduction of a 100% all natural liquid plant extract derived from sea kelp, vitamins, micro and macro nutrients. The existing microorganisms respiration is accelerate and the decomposition of organic matter is ten fold in water and soil.

Under normal conditions, microorganisms are subjected to a multitude of factors that inhibit the organism from completing its task. For example, wastewater extremes in temperature, insufficient oxygen, adverse pH levels and metabolic poisons are just a few. Px700 bio-stimulant protects microbes from harsh conditions and allows microbes the have the ability to dramatically increase the metabolic and reproductive rates of endogenous bacteria. Px700 bio-stimulant is non-selective, therefore, all microbes benefits.

AREAS OF BIOSTIMULATION

Microorganism activity is increased by physical changes in the treatment scheme; such as a change in aeration rates, return sludge, or recycle rates. Sometimes chemicals, other additives, enzymes, and even bacteria can induce stimulation. But this is usually a hit or miss situation (with emphasis on the "miss"). The reason that most fail to achieve the results they claim is due to the fact the problem may only be a small amount of nutrient or trace material is missing from the microorganisms.

Materials that can be used in the Bio-Stimulation process include the following:

- Bacteria
- Enzymes
- Ozone
- Peroxide
- Coagulants
- Folic Acid
- Polymers
- Bio-Zyme
- Bioxide

The problem with bacteria and enzymes is that they are very site specific. Enzymes are like keys, if the key fits the lock - things are great. But, if it doesn't - well?

Bacteria are very similar. If the media that they are grown on is like the media they will be added to, then sometimes they work. But, we must remember that treatment facilities already have plenty of bacteria available.

Ozone, peroxide, and other chemicals can help but they are rather limited to a certain set of conditions; such as adding peroxide to help "freshen" septic water in a collection system.

Most of the prepared products (Gel PAC, Poly BAC, Pro Dex, and others) are a combination of bacteria and nutrients that they need to survive. If conditions into which they are added are not compatible, then the results are often less than expected. There are only a handful of products on the market that are actually designed to stimulate the bacteria and other microorganisms present. These products work on the assumption that the level of microorganism's activity can be increased by the addition of trace nutrients and/or metals. Examples of these are Px700 and Folic Acid. These compounds have a very wide application range. Almost anything that has to do with organic matter and microorganisms can be

benefited. Px700 has proved successful not only in grease, odors, and sludge reduction, but also BOD reductions in the raw wastewater. Px700 is listed on the EPA Oil spill program the listed as acceptable on the State of California Fish and Wildlife.

DETERMINATION OF BIO-STIMULATION METHOD TO BE USED

There is really no cut and dried method to answer the question “What type of bio-stimulation should an individual decide to use?” Bio-Stimulation can benefit even the "best operation".

"BIOSTIMULATION" SUCCESSFULLY PRACTICED

There are three areas in which Bio-Stimulation have been successfully practiced. These areas can be classified into three headings:

- Odors
- Grease
- Solids Reduction

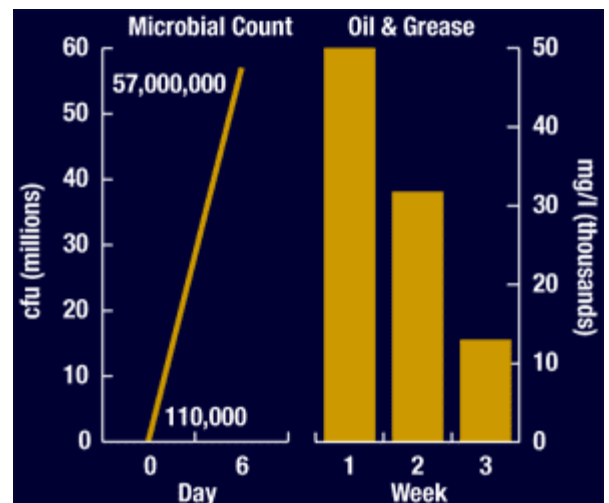
ODORS

Bio-Stimulation has been successful in reducing odors that have been bacterially produced. This is generally done by stimulating the micro-organisms to further break down the offensive compound and creating conditions that are not favorable to a build-up of FOG.

Specific locations include lift stations, grease traps, livestock arenas, compost piles, collection systems, livestock lagoons and holding areas, rest stops, septic tanks, sludge lagoons, lakes, ponds, fish farms, and process facilities.

GREASE

Grease and oil has long been the nightmare of wastewater treatment personnel. There are not many systems that at one time or another have not experienced a "situation" that involves grease and oil. According to most text books, an average domestic waste flow will have between 60 to 80 mg/L of grease. With current trends in the awareness of public health, there has been a swing from animal grease to vegetable oil. The grease balls and chunks of grease already indicate that some biological activity is taking place. Bio-Stimulation can cause a significant reduction in the amount of grease. Locations that have benefited from Bio-Stimulation include lift stations, grease traps, treatment plants head works, clarifiers, chlorine contact chambers, and filters.



"BIOSTIMULATION" SUCCESSFULLY PRACTICED (continued)

SOLIDS REDUCTION

Solids reduction has been achieved by Bio-Stimulation of the *sludge* according to the volume and percentage of volatile concentration. The higher the volatile concentration, the faster and greater the reduction. Facilities where solids reduction have been achieved include livestock lagoons, municipal sludge lagoons, industrial sludge lagoons, aerobic digesters, anaerobic digesters, aeration basins of all types of activated sludge plants and compost facilities.

In other words, if there are microorganisms in the material, then they can be stimulated to improve the process.

BIO-STIMULATION REQUIREMENTS

For Bio-Stimulation to work, the following minimal information is needed:

1. **AREA OF CONCERN** (This could be called a "problem", but no "right-minded" operator will admit to a problem).
2. How is the **CONCERN** measured? (i.e. Rotten egg odor could use a meter; grease could use a FOG Test; Sludge could use Total Sludge and Volatile Solids test) .
 1. Are there microorganisms present?
 2. How much flow needs to be treated?
 3. What is the volume of units to be treated?
 4. What constitutes a successful stimulation?
 5. Is it cost effective? (i.e. if it takes 100 gallons per day of a product that costs 45 cents a gallon and another product that costs \$100.00 per gallon but it only takes a quart to do the same job, this is a comparison of \$45.00 versus \$25.00).

The above is just minimal information. The more background data available, the better.

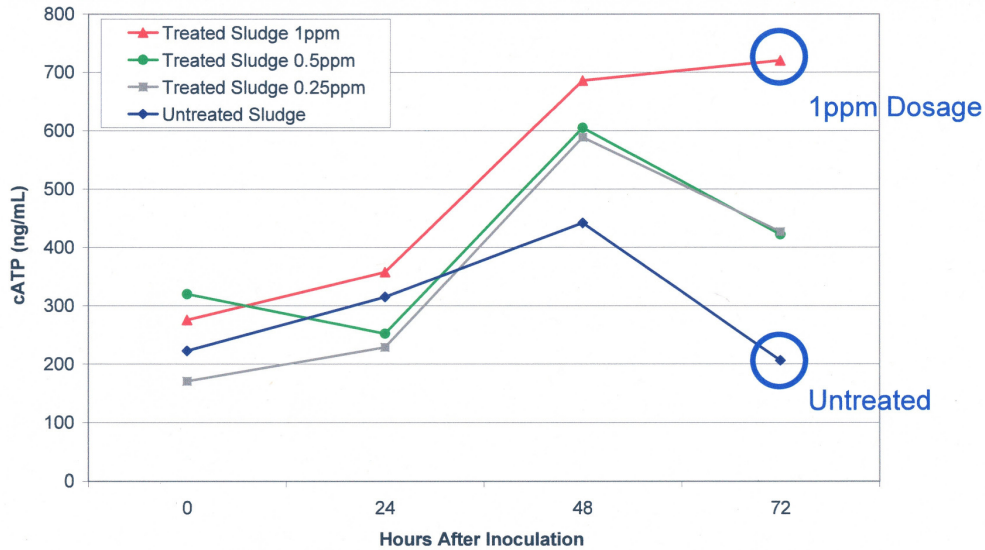
Results of Bio-Stimulation from a review of-the literature indicated some very remarkable results. Of course, not every application will be successful but for the most part, they can be minimized by following the above guidelines.

Above all, if you try Bio-Stimulation you must be open minded and willing to give the product a chance. In some cases, such as sludge reduction, it might be 2 or 3 sludge ages or more for achievement of results. If you don't have that approach then the results will negligible at best.

Bio-Stimulation will be a way in the future to bring plants into compliance and keep them there. This is the cutting edge of new technology that will become more and more focused as time goes on and as public pressure, call for a return to a more natural approach of treating waste.

APPLICATION RATES:

ACTUAL RESULTS OF Px700 ON GROWTH



While Px700 dosages of .025ppm and 0.5ppm both showed improved growth over the CONTROL (2x more active biomass in both cases), the recommended 1ppm dosage clearly showed the best performance. After 72 hours, the population began to crash in all cases except the 1ppm dosage, likely due to BOD and/or oxygen deprivation.

APPLICATION AT LIFT STATIONS AND COLLECTION LINES

Purpose: To eliminate grease and odors.

Up To 250,000 Gallons Daily Flow: • Add 12 - 16 ounces each day.

Up To 500,000 Gallons Daily Flow: • Add 16 - 24 ounces each day.

Up To 1,000,000 Gallons Daily Flow: • Add 36 - 48 ounces each day.

For Higher Rates Than 1,000,000 Gallons Per Day Contact:

Charles Jones, Enviro-Tech of America, Inc
1907 SW 47th St. Cape Coral, FL 33914
envirotechusa@gmail.com

NOTE 1: Chemical feed systems should be utilized for best results.

SLUDGE HOLDING LAGOONS DAIRY LAGOONS

CATTLE SLUDGE PONDS

- Shock with 1 gallon per every million gallons.
- Daily dosage thereafter of 12 - 24 ounces per million gallons.

FOR ODOR CONTROL IN LIVESTOCK AREAS:

- For **LARGE** areas, apply 1 gallon per 500 gallons
- For **SMALL** areas, apply 1 gallon per 50 - 100 gallons