Alpha Concepts
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Process Engineering, Process Management, Project Management and Environmental Management Solutions

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AlphaNutrients **Micronutrient supplement for biological treatment plants**

AlphaNutrients is a custom-made product which provides essential micronutrients to biological water treatment plants.

What are micronutrients?
Micronutrients are nutrients that are required in small amounts for growth and productivity. For water treatment plants, bacteria require a balance of nutrients (such as carbon and nitrogen) and micronutrients to process water effectively. Examples of micronutrients required by bacteria found in water processing plants are:

- Cobalt
- Iron
- Magnesium
- Manganese
- Molybdenum
- Zinc

What do they do?
The role of most trace elements is in assisting enzymes to function. Iron, for example, plays a crucial role in the energy-harvesting metabolism of most microorganisms. In biological treatment systems, the efficiency of the plant is directly dependent upon the growth of the bacteria and their ability to consume a particular nutrient or contaminant. Adding micronutrients improves the bacteria functioning on a cellular level, thus improving overall plant efficiency.

What do I need for my plant?
Every plant is different- the type and amount of micronutrients available in the feed water differs for every site. To make sure you get what you need, we take a sample of your water and have it analysed for micronutrient deficiency. We then provide you with a custom micronutrient mix containing the required elements in correct the ratio for that specific plant. We will also recommend the dosing amount for any major chemical addition that is required.

Case study
Micronutrient addition was trialled on a pilot plant designed to consume high levels of nitrogen in water taken from a full-size groundwater treatment plant. The bacteria were

supplied with oxygen and fed molasses at a suitable food-to-biomass ratio. Under these conditions, the treated water nitrogen concentration was measured as 80 mg/L over 2 consecutive days. At this point, micronutrients were added according to the deficiencies measured in the water. Nitrogen removal increased, resulting in a concentration of < 20 mg/L over the following day. From this point forward nitrification and denitrification rates were sustained to match influent loading.