TECHNOLOGY SHEET

BIOCATALYST FOR ACCELERATED BIOTREATMENT

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Biocatalysts are combination of enzymes, mineral nutrients, biosurfactants and fatty acids which enhance both aerobic and anaerobic biodegradation of organics. Enzymes are critical to the biodegradation pathway, facilitating the transfer of organic contaminants into the cell through the cell walls, and promoting the breakdown of the carbon backbone in the chemical structure of the contaminant. Mineral nutrients are essential for microbial growth providing major nutrients, such as phosphorus and nitrogen, as well as micro-nutrients, such as iron and manganese. Biosurfactants, produced by active bacteria, facilitate the transfer of the organics to the cell. Fatty acids, a major constituent of cell walls, accelerate the production of cells, by providing a readily usable raw material for the cell to manufacture cell walls. Experimental studies conducted with biocatalysts have shown remarkable improvements in both aerobic and anaerobic biodegradation rates in bioreactors, such as aeration basins and anaerobic digesters in wastewater treatment plants.

PRD, Inc. has a unique biocatalyst, **PRD-BIOSPEEDUP**, which is capable of accelerating biological degradation reactions in bioreactors, soils, sediments, and in biofilters. The acceleration effect has been demonstrated for both aerobic and anaerobic reactions. Presence of anaerobic zones due to lack of mixing and occurrence of low dissolved oxygen areas, results in formation and emission of hydrogen sulfide and/or ammonia from open tanks, ponds, lagoons, etc. Use of **PRD-BIOSPEEDUP** causes acceleration of both aerobic and anaerobic bacteria, thereby preventing the formation of dissolved sulfides and emission of hydrogen sulfide, as well as formation and emission of ammonia. Speeding up anaerobic bacteria results in reduction in fats, oils and grease, which is usually difficult to treat by aerobic bacteria. Accumulation of organic wastes, which are slow to aerobically biodegrade, in water treatment systems, is substantially reduced using **PRD-BIOSPEEDUP**.

Wherever biological treatment is involved or occurs, biocatalysts can play an important role.

Potential applications of **PRD-BIOSPEEDUP** include:

- Reducing biological treatment time for hazardous organics at Superfund sites;
- Elimination of odors from degradation of organic wastes;
- Elimination of emission of hydrogen sulfide and/or ammonia from anaerobic digesters, ponds, lagoons, aeration basins, etc.;
- Accelerating treatment of odors and volatiles in compost and synthetic media biotrickling filters;
- Reducing accumulation of organic wastes in ponds and lagoons located at composting operations, farms, etc., thereby eliminating the need for dredging;
- Reducing emissions of odors from hog, horse, chicken and turkey farms;
- Delaying the breakdown of manure products thereby eliminating odors during storage and shipment;
- Eliminates the formation of foam in aqueous systems especially during air sparging;
- Increases production of methane in anaerobic systems, thereby providing more fuel gas for heating and reduces energy consumption; and
- Environmentally friendly and non-toxic to plants, animals and people and does not introduce any toxicity into the product.

Typical dosage of the biocatalyst is sub-ppm levels in aqueous systems for the above benefits to be realized. PRD has also developed unique delivery systems to apply the biocatalyst to large-scale flows and solids handling systems. Delivery of the biocatalyst is central to its success in any full-scale operation, and these delivery systems are capable of providing the biocatalyst at controlled rates, with minimal energy consumption and hence operating cost.

If you have a potential application of **PRD-BIOSPEEDUP**, call and begin to realize substantial savings in operating costs with significant improvements in treatment effectiveness at minimal capital expense. Payback times are usually less than 6 months with improved process treatment efficiency that cannot be realized by any other technology.