Biosolids Treatment Process

When raw sewage first enters the Wastewater Treatment Plant, non-organic solids, such as plastics and metals are removed by mechanical screens for disposal at a landfill. The wastewater then flows by gravity into aeration basins where the liquid and biosolids treatment and removal processes begin. In the aeration basins, raw sewage is continuously mixed and aerated. Microorganisms thrive in this oxygen and food rich environment, consuming the organic material present in the wastewater. The food to microorganism ratio is monitored very closely to ensure the proper balance is maintained.

Once a stabilized "mixed liquor" is obtained, it is sent to clarifiers – large concrete tanks – where the partially digested organic material and microorganisms are allowed to settle to the bottom as sludge. This material, known as "activated sludge" is pumped from the bottom of the tank for further processing. Some of this sludge is pumped back to the aeration basin as "seed" for the treatment process. This is known as "return activated sludge", or RAS. The remainder of the sludge, known as "waste activated sludge", or WAS, is pumped to holding tanks where the digestion and settling process continues. This process generates a significant amount of heat, which is critical in killing pathogens in the waste.

After spending a suitable amount of time in the storage tanks, the WAS is pumped to a dewatering process that further thickens the sludge. The thickened sludge is what is known as a "Class B" biosolid. It is still in a thick liquid form, and can still have odors, but can be land applied as a liquid soil amendment and fertilizer to agricultural land. Class B Biosolids are restricted for use on grass seed and animal crops, such as hay.

Additional processing to create a "Class A" biosolid involves a heated centrifuge which further reduces the liquid content and level of pathogens, producing a dry "cake" product that can be applied to gardens, lawns, rose bushes, city parks, and crops that are grown for human consumption.

Biosolids production is a proven, sustainable technology that provides a cheap source of nitrogen, which is a real benefit for farmers, especially in today's economy. Wilsonville has been providing Class B biosoids to some fields for almost 20 years, and can supply up to110 pounds of nitrogen per acre. However, Class B biosolids do have limited use, particularly during winter months. In the winter, Class B biosolids are typically shipped to eastern Oregon.

With the planned upgrade and expansion of the Wastewater Treatment Plant, the city plans to move to the production of a Class A biosolids product, moving away from Class B and liquid application. This will provide expanded options and locations for disposal or sale of the product, which is expected to save the City money.

For a description of the liquid treatment process, see the *Liquid Treatment Process* page.