

RBC SERVICES UPDATE

RBC Services
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SOLUBLE BOD, FIRST STAGE LOADING, STAGING & NITRIFICATION

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Most of the survey cards which were sent out with the last RBC Services UPDATE have been completed and returned for which I thank you.

For those of you who may still have the card somewhere on your desk, please fill it out and send it in. If you didn't receive a card, one can be sent to you. I would appreciate hearing from as many of you as possible. Your feed back helps us to provide you with the type information you want about your RBC operations.

Due to the wide range of subjects which were requested for discussion, I have answered many of you on an individual basis. However, there were a number of requests regarding first stage Soluble BOD loading, RBC staging and nitrification. Because of their interconnection, that is the topic chosen for this UPDATE.

I will tell you now that the information provided in this UPDATE is general. However, it will be sent to approximately (650) RBC plants. And, due to the fact that each plant's influent, process and requirements are different, it is impossible to get more specific. That is also the reason you find little or no process related information in your RBC O&M Manual.

The majority of municipal RBC plants handle a standard domestic waste. But, when calculating for necessary RBC treatment surface area, up to 10% of the influent may be considered industrial. Most loads from an industry are very high or sometimes nearly total Soluble BOD.

Most RBC plants are not required to analyze for Soluble BOD on the monthly data sheets which are submitted to the local regulatory agencies. However, this test is the only way to determine the effectiveness and efficiency of BOD removal with the RBC treatment process.

Removal efficiency requirements for RBC plants can range up to 98%. With this in mind, the most critical aspect of the RBC process is SBOD loading, particularly to the first stage.

If the first stage is overloaded, the rest of the system will not perform as expected. And this overloading should not be confused with hydraulic or physical loading, but organic loading, even though one normally leads to the other.

The original calculations for total treatment surface area needed, considered permit effluent BOD requirements to determine the number of treatment stages which are necessary. Some RBC plants have multiple stages while others have only one stage. The requirements vary from plant to plant.

Generally speaking, the influent BOD to the RBCs is approximately 40% to 50% Soluble. This needs to be converted to pounds. According to EPA studies, for optimum treatment with RBCs which are not aerated, loading to the first stage should not exceed a recommended 2.5 pounds of SBOD per day per 1,000 square feet of surface area.

If the RBCs are aerated, the maximum loading is a recommended 3.5 pounds of SBOD/Day/1,000 sq.ft.

Depending on the configuration of the RBC tank at your plant, you may have the capability to expand the first stage of treatment to accommodate the level of SBOD loading, should it be necessary. This may also hold true for subsequent stages.

At many plants, depending on effluent requirements, the RBC tank design included removable baffles between the units to create separate treatment stages. Whether or not this feature was included at your plant was determined by the effluent requirements. Each stage generally decreases in size as the process progresses.

Again, requirements vary from plant to plant. Regarding nitrification using the RBC process, significant nitrification will not occur until the SBOD level is at or below 15 mg/l.

At higher SBOD concentrations, ammonia oxidizing organisms cannot compete with carbon oxidizing organisms.

Most everything regarding the RBC process is based on its ability to reduce SBOD. If there are problems with that aspect, there will, more than likely, be problems experienced downstream. I must add however, that the cause of many problems begin ahead of the RBCs.

If test analyses can be done at various process points throughout the plant, you can get a good handle on the source of most any problem.

Again, due to the general nature of the explanations in this UPDATE, if you have any questions regarding RBC loading, staging and tank configuration, please do not hesitate to give us a call - toll free. We'll do what it takes to get you the answers for your particular situation.