Benefits of Bacterial Treatment at Sewage Pumping Station (SPS)

1. **Why bacterial treatment is required in the Sewage Pumping Station?**

   - When the ex-situ bacteria are being added into the system, the bacteria reverses the process of putrefaction and therefore **reduces the amount of H_2S production**. H_2S when reacts with moisture produces H_2SO_4, which is highly corrosive and hence corrode the machinery in the system. By reducing the amount of H_2S production due to the addition of bacteria, will help to avoid the corrosion of the machinery and hence wear & tear in the system will reduce to great extent.

   - Putrefactive types of microorganisms emits foul odour. By adding bacteria into the system, the process moves towards the fermentation process and therefore **reduces the odour** in the system.

   - H_2S is very dangerous to human life. When inhale in large concentration can cause to even death. By addition of these bacterial cultures into the system, H_2S production will reduce in the sewer line as well as in manholes and hence **reduces the risk to life**.

   - Due to the free flowing sewage in the drain line, the heavy matter gets settled at the bottom of the line and hence reduces the overall volume of the drain line. By addition of bacterial cultures, the amount of **organic silt will get reduce to great extent** as the ex-situ bacterial cultures have the capability of digesting the organic particles present in the sewage.

   - The bacterial cultures added into the system will degrade the organic matter by certain biochemical reaction and hence the total organic load **(i.e BOD) going to STP will get reduce to 5-10% (at PST) and app. 10-15% at the outlet (at FST).**

   - If the multiple stage pumping is being done then due to the increased retention time of sewage through the drain lines, the overall quality of effluent will get improve and **influent of much better quality** will be delivered to the STP'S.

2. **What are the advantages of this treatment over other existing system?**

Major advantage of this type of treatment is that this treatment will not lead to any changes to be done in conventional treatment system. This is the additional treatment which is done in order to improve the overall efficiency of the system. Some of the major advantages are as follows:

- The use of this type of treatment will lead to large reduction in the running cost of ETP/STP/Septic tank.
- Mark impact on the reduction of BOD, COD, TSS, O&G etc.
- It suppresses the foul odour in a very short time
- Upto 10% reduction in the organic sludge volume in the plant.
- Enhance the methane gas production in the digesters.
- Large impact on the reduction of feacal coliform count.

3. Is there any government or CPCB recommendation in this regard.

As such there is no recommendation from CPCB but this type of treatment will not affect the existing system in any of the way and hence very important in current scenario as the volume of sewage generation is increasing at a tremendous rate.

4. Is there any product or technology which may replace the above mentioned product

The product which we have mentioned are the ex-situ bacteria which are very specific and efficient for the degradation of the organic compound present in the sewage waste. These bacteria replicates in a normal manner and hence single mother population will lead to the production of multiple daughter cells. The bacteria work in its normal manner and degrade the organic particle by indulging the particle into its cell wall and therefore lead to the digestion of organic matter.
There are many other products available in the market which is **Enzyme based**. These enzymes will act as a catalyst that helps to speed up the biochemical reaction. They help in breaking down the larger organic particles into smaller particles but never digest those particles. So they are the temporary solution to the problem and there consumption will be required on daily basis in the plant.

5. Cost Per MGD

Cost per MGD depends upon the plant condition and applications of the bacterial/enzyme treatment. It may vary from Rs. 950 to Rs. 3000 per MGD.

6. **Being used in STP since 2004**

<u>Benefits of GreenWay's Bacterial Treatment over others</u>

S. No.	*PARAMETERS*	*OTHERS BIOAUGMENTATION SYSTEM*	*Our BIOAUGMENTATION SYSTEM*
1.	**Application of bacterial cultures**	One time addition in a day	Continuous dosing of EM throughout a day in accordance to the flow in the plant to maintain uniformity if bacteria throughout the system.
2.	**Technology**	Bacteria are added to degrade the organic matter only.	Co-existance of bacteria is there. This means dual nature of bacteria which suppresses the growth of harmful bacteria as well as those produces useful substances from organic matter present in effluent.
3.	**Odour reduction**	No or very little odour termination	Odour termination by controlling the phenomenon of Putrefaction. Mark reduction in H_2S and ammonia gas production.
4.	**Indication of activation of bacterial culture**	No indication	Production of lactic acid by lactobacillus species which makes the solution of Activated EM acidic in nature. Also the white layer forms on the top surface of

			the solution after proper activation which signifies the presence of yeast in it.
5.	**Feacal coliform count**	No such objective is listed so far	More than 90% reduction in feacal count because of presence of yeast which suppresses the growth of pathogenic microorganisms after continuous application of EM for 50 days.
6.	**Heavy metal reduction**	Not there	Convert heavy metal ions into organic chelates that help in reduction of heavy metals.
7.	**Reusability of final treated water**	Can be used for agriculture/horticulture	Final treated water is beneficial for the agricultural/horticulture use as it consists of Yeast which synthesizes the plant growth hormones which is helpful in stimulating the plant growth.

Preparation and dosing method:

For first month:

20 litres (Concentrated form)

Dilution rate: 1 (EM): 1 (Jaggery) : 18 (water-ltrs)

This means 400 lites activated EM for the first month

From next month:

10 - 15 litres (Conc.) depending upon the state of the plant.

You will just dose regularly for the first 7 days (20 liters activated EM on daily basis). Then you will come on alternate days.