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*Bioremediation: Using Bacteria to Reduce  $NO_2^-$ ,  $NO_3^-$  and Ortho- $PO_4^{3-}$*

The purpose of the project is to introduce a new, cost effective method to reduce levels of nitrate, nitrite, and ortho-phosphate in the river. The new method included inoculating the river with bacteria present in influent and then feeding the bacteria with a nutrient buffer. Escherichia coli were specifically looked at in the project.

Four water samples were created for the project: river, river with influent, river with influent and nutrient buffer, and de-ionized water with nutrient buffer. Specific tests were then conducted to determine the nitrate, nitrite, and ortho-phosphate, dissolved oxygen, and Escherichia coli in the water samples. Once the tests were completed, the samples were kept in one place for 24 hours. After the 24 hours, the same tests conducted before the 24 hours were conducted again.

After experimentation, the hypothesis was proven wrong because feeding the influent bacteria in the river with nutrient buffer sample led to an increase in the level of nitrate, nitrite, and ortho-phosphate level. Although the hypothesis was proven wrong, a new method was discovered based on the experiment results. This method is that inoculating the river with influent led to a decrease in the ortho-phosphate level and Escherichia coli colony count.

In conclusion, while the method proposed may not be effective in decreasing the nitrite, nitrate, and ortho-phosphate levels, the new method found is effective in reducing the level of ortho-phosphate in the river. The new method is inoculating the river with influent for a period of 24 hours.