The Effects of Sewage Pollution on the Occoquan Watershed and Possible Solutions

Abstract

The purpose of this paper is to explain sewage pollution, how it affects us, and the solution. Sewage pollution can be harmful if untreated, so it is important we solve this issue while being cost effective. This paper includes the results of a survey to show peoples thoughts on sewage pollution. The best solution is to plant trees, because it is solves the issue of sewage pollution and is cost effective. There are many ways to get our community involved in our project, but the best is to get the students involved.

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According to www.water-pollution.org.uk, sewage is defined as, "Wastewater that often contains faeces, urine and laundry waste". Pollution is defined by Oxford Living Dictionary as, "The presence in or introduction into the environment of a substance which has harmful or poisonous effects." These two definitions put together creates the definition of sewage pollution. Sewage pollution has grown as an issue throughout our watershed, but people do not think it is an important issue because they think it does not affect them directly. Each year in Alexandria, Virginia, 11.3 million gallons of sewage mix with the water in the Potomac River. Human sewage is filled with salmonella, hepatitis, and other infectious diseases. This makes the water dangerous for people to be in, and if they do go into the water, there is a high chance they will become sick. This problem does not only affect us here in Burke, Virginia, but also countries around the world. According to the World Health, in Afghanistan, only 46% of the population has water that is not tainted with sewage. Over 50% of the population has to drink water that could cause them serious harm. Due to these facts, sewage pollution needs to be solved, and there are many solutions, and this paper will outline the most helpful one.

We conducted a survey about sewage pollution to gather information on what people in our surrounding communities think of the issue. Forty three people took our survey. Thirty four had heard of sewage pollution, six had not, and three were unsure. When asked how concerned they were with this issue on a scale of 1-5 (5 being extremely concerned), 19 people said they were a 3 (moderately concerned) and 13 people were a 2 (slightly concerned). No one was a 5, although 5 people were a 4 (very concerned). This shows people are aware, but not extremely concerned. 39 of the 43 people did not believe they were affected by sewage pollution. Four

people believed they were. 30 didn't have knowledge pertaining to sewage pollution, but 13 did. The 13 people who answered yes were then asked to explain. One person wrote, “Untreated sewage pollution makes its way to our streams and rivers to pollute our watershed.” Last, was space for people to write about anything pertaining to sewage pollution that could be helpful to us. One person said, “Sewage pollution is a very big threat to biodiversity in water sources.” There were other comments, showing that sewage pollution is an issue that needs to be solved.

On January 4th, 2019, two members of our group visited the Upper Occoquan Service Authority Sewage Treatment Plant to retrieve information about how sewage treatment is being dealt with in our community. It was a great chance to ask questions and also understand the

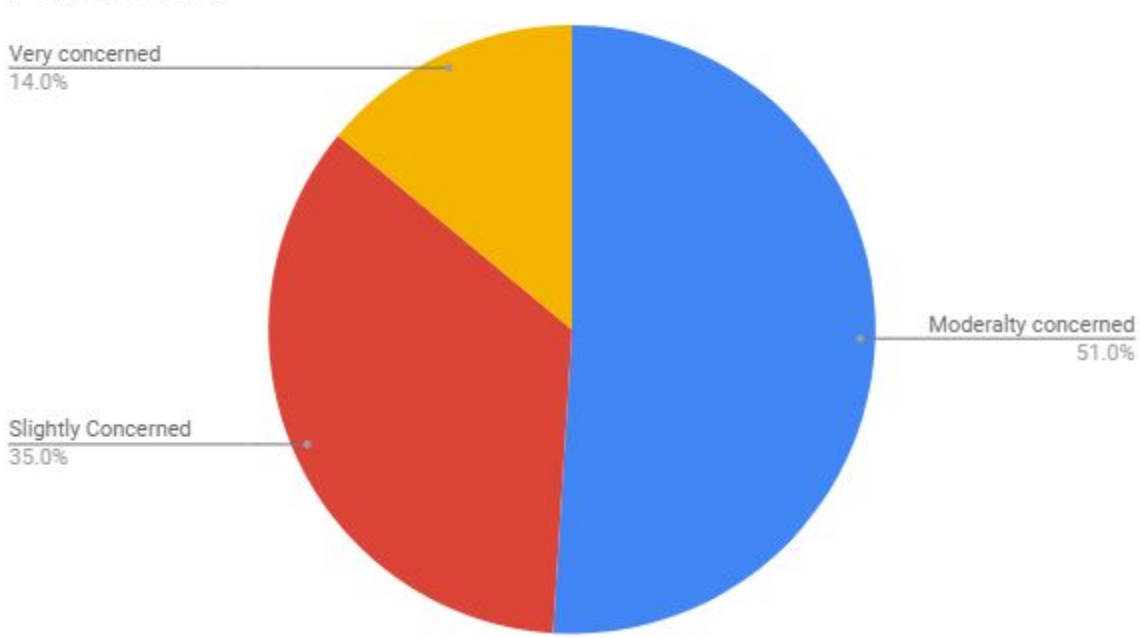

Figure 1. Results from a survey conducted that asked how much people were concerned about the issue of sewage pollution.

process of sewage treatment. During this visit, we had the chance to talk to Robert Canham, director of water treatment process at the plant. We also learned about how polluted water comes

to the plant and is cleaned so it can be used for drinking or other activities. Canham also highlighted the effects of sewage pollution on organisms in it and the environment itself. All together Canham said he believes that sewage pollution is increasing, and he thinks that his treatment plant is one of the things that is helping the growing problem.

We were able to determine, from our survey that people are aware of the issue of sewage pollution and do realize it needs to be solved. One solution we have come up with is to plant trees. This maybe simple, but it is an efficient and cost effective way to help the problem. The trees collect stormwater that would otherwise get into the sewage. This could cause the sewage pipes to overflow, which would lead to it polluting the nearby water sources. Ford Motor Company recently started growing 10 acres of plants on the roofs of a truck factory in Missouri. This by itself kept 4 million gallons of stormwater from going into the sewage system. The positive side of this solution is that it keeps the sewage from overflowing and polluting the water, and is much cheaper than expanding the sewage pipes to accommodate the excess stormwater. The negative is that there would need to be space available to plant the trees, and open space is hard to find in communities in this day and age.

Another solution is to update the wastewater infrastructure. This would prevent sewage from overflowing or seeping through the cracks. However, this process is expensive, such as billions of dollars, and will take years to complete. For these reasons, it is best to stick with planting trees because it is cost effective and can have a more immediate effect.

We need students to understand our project in order for it to be successful. Students in school now will be the ones who this solution will affect the most. We will persuade students to help us by offering community service for anyone who participates, while making sure they

understand the long term impact. We will create flyers to advertise the opportunity and put them up around Lake Braddock. We will also create ads to put on the Morning Bru to advertise further. Once we have a large number of students, we will go out and plant the trees.

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