



FACTSHEET

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CHOOSING WASHWATER OR WATER TREATMENT TECHNOLOGIES

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Introduction

A number of factors need to be considered when selecting a water treatment technology. First and foremost the problem should be characterized by sampling the washwater, collecting information on water quality standards, the volume of wash water to be treated, and allowable concentrations of contaminants in the treated water. After this information is collected and the issue limiting the quality of water has been identified, the process of choosing a water treatment technology can begin. There are three categories of criteria to consider: costs, functionality, and site requirements. Each category will be discussed and a summary can be found in Table 1.

Treatment Costs

When considering the cost of a treatment technology it is essential to look at more than just the capital cost. Almost every treatment technology will have an associated operating cost. Some technologies' only expense may be the cost of electricity required to pump water while others could require a designated operator to monitor and service the technology. Other operating costs can be for cleaning and maintenance; for example, time and equipment is needed to regularly clean out settling tanks. Some technologies require regular chemical inputs such as coagulants and flocculants or disinfection products to ensure efficient operation. The capital and

operating costs of operating a water treatment system can add up and it is important to take these into account when deciding what technologies to use. Conversely, a properly designed water treatment system has to the potential for economic return. There is likely an opportunity to reuse treated water thereby reducing inflow needs and often the removed waste can be repurposed as well, for example, removed organic material can be used as compost.

Functionality

The treatment goals and requirements must be identified to properly select a technology. If water is to be reused instead of discharged, different levels of treatment may be required to meet food safety guidelines. In general, water treatment systems will have multiple steps that progressively improve water quality. Each of these steps target different contaminants such as solids, organic material, nutrients, or pathogens to provide complete treatment. For example, when treating carrot wash water, the first step would be to remove the large solids such as carrot pieces and other vegetative material. Following primary treatment the wash water would be cleaned further to remove the smaller soil particles and organic material thereby increasing the efficacy of subsequent technologies. Finally, the water would be treated to remove any dissolved nutrients and organic material and then disinfected to remove any pathogens.

Table 1: Selection criteria for vegetable washwater treatment technologies

Costs	
Capital cost	
Operating cost	
Functionality	
Discharge or reuse?	
If reuse, does it need to be potable?	
Targeted contaminants (solids, organics, nutrients, etc.)	
Primary, secondary, or polishing technology	
Flows (min/max; batch/continuous)	
Seasonality (year-round or seasonal washing)	
Proven technology under similar conditions?	
Site Requirements/Considerations	
Technical requirements (electricity, plumbing, etc.)	
Operational requirements and ease of use	
Pre-treatment requirements	
Indoor/outdoor	
If outdoor, winter considerations for efficiency of technology?	
Footprint/land area required	
Soil profile (for outdoor tanks, vegetated filter strips)	
Waste by-products	

Depending on the characteristics and type of wastewater the required, the number of treatment steps will vary.

Other considerations include whether the technology has a proven track record for treating the similar wastewaters. Also, certain technologies may have seasonal limitations such as freezing in the winter and will need to be installed indoors. The type of flows the technology is designed to handle is important. Some technologies (i.e. biological systems) require continuous flows to function rather than batch or intermittent flows. Technologies also

must be able to handle the maximum or minimum flows of a site and not just the average flow.

Site Requirements/Considerations

There are certain accommodations necessary on a site depending on which treatment technology is chosen. The proper electrical connections and plumbing need to be installed, an area must be dedicated to the technology according to its footprint, and it will need either indoor or outdoor space. If the new technology is to be inserted into an existing

treatment system, it must be determined if the pre-treatment requirements are properly met. Also, many treatment technologies produce waste by-products and a plan should be created to manage this waste prior to installation. The operational requirements and ease of use of a treatment technology also need to be considered. Some technologies require constant care and possibly even a full time operator to monitor and maintain the system. Others may only need to be checked occasionally during operation and can be controlled via programmable logic controller (PLC).

Conclusion

Choosing a water treatment technology can be a complicated process as there are many variables to consider and treatment options. The most important factor is to fully understand the problem before proceeding with the solution. Then, narrowing down what technology is best suited to address that problem will be less complex. Every situation is different and it is important to approach each situation with an open mind as a successful system at one facility may not suit another.

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