

BSF Technician Competencies: Sand


Instructions

This competency assessment tool was designed by CAWST to measure and guide the professional development of BSF Technicians. The tool contains a scale from 1-3, representing competencies in foundation, intermediate, and specialist skill levels. Level 1 is for technicians that build biosand filters (BSF). The specialist level is for people training or providing consulting support on the BSF. Technicians should complete the levels within the competencies groups that are relevant to their work. A specialist must complete all competency groups.

Each competency level contains multiple bullets that describe expected behaviours or knowledge at that level. To have these competencies validated they must be physically demonstrated or verified with knowledge or theory-based questions in a discussion. Further instructions for this assessment are described below and within the framework guide.



Sample Table

This section will list a specific competency group


	Foundation	Intermediate	Specialist
1	This section describes a basic level of competency for a technician.	This section describes an intermediate level of competency for a supervisor	This section describes a high level of competency. It is for people providing training or consulting support on the BSF
Competency group			
Competencies verified through observation are unmarked. Competencies verified through knowledge questions are marked with the following book symbol  .			

Before using the tool, ensure you understand the competency process overall. In conducting the assessment, select the competency level which can be verified and mark it complete. Once all competency groups are completed, revisit them and select specific areas to improve. Competencies a candidate wishes to identify for improvement can be prioritized within this document and then carried over to their *Learning Plan*. The *Competency Development Activities* document will help you select ways to improve your priority competencies. Once a candidate has demonstrated all competencies within a particular level they can be validated at that level and receive a certificate for their achievement.

Competency Group: Workplace Safety

		Foundation	Intermediate	Specialist
1	Workplace Safety	<ul style="list-style-type: none"> <input type="checkbox"/> Follows workplace safety procedures <input type="checkbox"/> Uses personal protective equipment properly <input type="checkbox"/> Identifies the location of first aid and safety equipment <input type="checkbox"/> Identifies the person to call in an emergency 	<ul style="list-style-type: none"> <input type="checkbox"/>  Describes safety concerns during the production <input type="checkbox"/>  Explains how workplace safety procedures reduce the risk of injuries 	<ul style="list-style-type: none"> <input type="checkbox"/> Identifies gaps in workplace safety procedures <input type="checkbox"/> Recommends way to improve workplace safety

Competency Group: Monitoring

		Foundation	Intermediate	Specialist
2	Monitoring	<ul style="list-style-type: none"> <input type="checkbox"/> Demonstrates how to use monitoring forms 	<ul style="list-style-type: none"> <input type="checkbox"/>  Explains the importance of using monitoring forms for sand preparation <input type="checkbox"/> Consistently uses monitoring forms <input type="checkbox"/> Uses monitoring forms to identify problems with sand preparation 	<ul style="list-style-type: none"> <input type="checkbox"/> Recommends changes to improve sand preparation processes based on monitoring forms

Competency Group: Sand

	Foundation	Intermediate	Specialist
3 Pathogen Removal	<ul style="list-style-type: none"> <input type="checkbox"/> Explains why it's important to treat your water <input type="checkbox"/> Explains what a BSF is for 	<ul style="list-style-type: none"> <input type="checkbox"/> Describes the four types of pathogens <input type="checkbox"/> Explains the mechanisms through which the BSF removes pathogens <input type="checkbox"/> Explains the limitations of the BSF for virus removal 	<ul style="list-style-type: none"> <input type="checkbox"/> Explains how the BSF removes: helminths, protozoa, bacteria, and viruses <input type="checkbox"/> Explains the effectiveness of the BSF at removing different types of pathogens
4 Sand Sourcing		<ul style="list-style-type: none"> <input type="checkbox"/> Explains benefits and limitations of locally available sand sources <input type="checkbox"/> Explains why quarry sand is the best sand for the BSF <input type="checkbox"/> Identifies common sources of sand contamination <input type="checkbox"/> Determines whether the sand in a particular source falls within acceptable parameters by doing a sand grain analysis or a flow rate test 	<ul style="list-style-type: none"> <input type="checkbox"/> Explains the impact of different sand contaminants on the performance of the BSF <input type="checkbox"/> Explains the role of pore size and surface area in pathogen removal <input type="checkbox"/> Defines uniformity coefficient, effective and maximum grain size and silt content <input type="checkbox"/> Explains why these parameters are important <input type="checkbox"/> Explains the recommendations for each parameter <input type="checkbox"/> Identifies whether problems with BSF performance are related to sand sourcing <input type="checkbox"/> Recommends changes in sand sourcing to improve filtration sand quality and production efficiency

<p style="text-align: center;">4</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Sieving Sand</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Inspects a sieve to determine whether larger pieces can pass through <input type="checkbox"/> Sieves the sand using the appropriate sieve for the appropriate media <input type="checkbox"/> Keeps sieved and unsieved materials separate from other materials and free from contamination 	<ul style="list-style-type: none"> <input type="checkbox"/> Explains why it is important to separate sieved sand from other materials and contaminants <input type="checkbox"/> Explains the role of the different sizes of sand and gravel <input type="checkbox"/> Constructs, inspects and repairs a sieve correctly 	<ul style="list-style-type: none"> <input type="checkbox"/> Identifies whether problems with BSF performance are related to sieving <input type="checkbox"/> Recommends ways of improving the quality and efficiency in sand and gravel sieving for small and large scale operations. <input type="checkbox"/> Explains why the recommended sieve size changed from 1 mm to 0.7mm
<p style="text-align: center;">5</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Washing Sand</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Explains why it is necessary to wash BSF sand and gravel <input type="checkbox"/> Determines whether the filtration sand was washed too much, too little, or enough using the jar test <input type="checkbox"/> Adjusts number of sand washes based on the results of the jar test <input type="checkbox"/> Washes filtration sand and gravel correctly <input type="checkbox"/> Keeps washed sand and gravel separate from other materials and free from contamination 	<ul style="list-style-type: none"> <input type="checkbox"/> Interprets the flow rate test to determine whether the sand has been over or under washed <input type="checkbox"/> Explains why flow rate is important <input type="checkbox"/> Explains how silt content influences flow rate <input type="checkbox"/> Explains the limitations of the jar test 	<ul style="list-style-type: none"> <input type="checkbox"/> Identifies whether problems with BSF performance are related to sand washing <input type="checkbox"/> Recommends ways of improving efficiency in sand and gravel washing for small and large-scale operations <input type="checkbox"/> Explains ways to reuse the water required to wash the sand and gravel