WSPs for Small Water Supplies at a Glance

Water Safety Portal

Task 1: Engage the community and assemble a WSP team

Engage with key community members to generate interest and support for WSP development and implementation. In particular, participation and buy-in from community leaders and decision makers is essential to secure the necessary resources to support water safety planning activities.

Establish a WSP team with strong leadership to develop, implement and maintain an effective WSP. The team should include individuals with the authority to take action to improve the water supply system, as well individuals with sufficient knowledge of catchment activities, water supply operations and water quality. Consider what additional external support may be required, for example, from the local water authority, the local health authority and NGOs.

Document the WSP team, clearly defining the roles and responsibilities for each member of the team.

Task 2: Describe the community water supply

Provide a thorough and accurate description of the entire water supply system, from catchment to consumer, with sufficient detail to enable the WSP team and the community members identify hazards and their potential impacts on water safety.

Draw an overview map of the water supply system considering:

- human activities and land-uses within the catchment
- water source(s) being used by the community
- treatment steps (if any)
- distribution and consumer points of use (such as tap stands, water vendors)
- consumer practices, (such as drinking-water collection, transportation, household storage, treatment and handling).

Describe the intended users and uses of the water supply. Discuss the community's aspirations with regards to water quality objectives - compare this to the water quality achieved in practice, as well as any prevailing water quality standards.

Task 3: Identify and assess hazards, hazardous events, risks and existing control measures

> _Hazard_: A chemical, physical or microbial agent that can cause harm to public health.
>
> _Hazardous event_: An event or situation that introduces hazards to, or fails to remove them from, the water supply.
>
> _Control measure_: An activity or process to prevent or eliminate a water safety hazard, or reduce it to an acceptable level (also known as a 'barrier' or 'mitigation measure').
>
> _Validation_: The process of obtaining evidence that the control measures can effectively control the hazard.
>
> _Risk_: The _likelihood_ that a hazardous event will occur combined with the _severity of its consequence_s.

**Part 1 - Identify the hazards and hazardous events:** For each step in the water supply system, consider:

- what can go wrong (for example, what has happened in the past, what may happen in the future)?
- how and why might it go wrong?
- when and where might it go wrong?

Consider sanitary inspections (and their associated forms) to support hazard identification and WSP implementation in small water supplies.

_**Part 2 - Identify the _existing_ control measures and validate their effectiveness:**_ For each hazard and hazardous event, consider what, if anything, is being done to prevent this from happening? Determine if these measures can effectively control the hazard in question.

Important distinction – Task 3 considers the _existing_ control measures that are currently in place to control water safety hazards, whereas Task 4 considers what _additional_ control measures are needed to effectively manage these risks.

**Part 3 - Assess the risks:** The risk associated with each hazardous event should be assessed to distinguish between significant and less significant risks. This will allow the WSP team to clearly identify which actions are the priority. Depending on the local context, the risk assessment methodology may range from a more sophisticated approaches (e.g. a risk assessment matrix) to a more simplistic approach (e.g. the WSP team deciding as a group how important is a particular hazardous event).

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Example of a table from a WSP to document hazards, hazardous events, control measures and their effectiveness, and the subsequent risk assessment using a risk matrix:

What could go wrong? **What is being done about it and is it effective?** **What is the risk?** **Is there a need to do more?**

Process step	Hazardous event	Hazard	Existing control measure(s)	Are the existing control measures effective?				Risk assessment			Additional controls needed?		
				Yes	No	Somewhat	Basis	Likelihood	Severity (Impact)	Classification	Yes	No	If yes, proposed controls?
Catchment	The source water is faecally contaminated due to open defecation in the catchment area	Microbial	None	-	-	-	n.a.	Likely	Major	High	✔		Support local NGO with development of community-led total sanitation scheme
Treatment	The water is microbially contaminated due to use of out-of-date chlorine powder for disinfection	Microbial	None	-	-	-	n.a.	Possible	Major	High	✔		Stock management procedure for handling/storage of chlorine powder and caretaker training
Distribution/ Storage	Ingress of contaminants to the water supply network due to low pressure in the network following supply pump failure	Microbial Physical Chemical	Pump maintenance programme			✔	Supply pump occasionaly breaks down due to long delivery times for replacement parts	Possible	Moderate	Medium	✔		Additional (stand-by) supply pump in case the duty pump fails
Household	Contamination of drinking-water due to use of insanitary utensil for handling water	Microbial	Consumer education and awareness programme	✔			Routine household visits by public health officer confirms that sanitary handling practices are in place	Unlikely	Moderate	Low		✔	n.a.

Detailed improvement plan needed where the risk level is unacceptable

Depending on the local context, this approach can be simplified even further as shown in the following table.

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Example of a simplified table from a WSP to document hazards, hazardous events, control measures and their effectiveness, and the subsequent risk assessment using a WSP team group decision:

What can go wrong?	If the event happens, what hazard(s) may make the water unsafe?	Is this event under control?	How important is this event?	Is additional control needed?
Water vendors using dirty water storage tanks to distribute water to consumers	This may introduce pathogenic microorganisms into the water	No control measures in place	***Very important***: Over half of the community receives its water from the water vendors every day Pathogenic microorganisms can cause serious illness. Diarrhoea cases are frequently reported from water vendor customers	Yes Water vendor awareness and education programme

Task 4: Develop and implement an incremental improvement plan

Develop, implement and maintain a detailed improvement/upgrade plan to address all significant risks that require additional control.

An incremental improvement plan allows step-by-step improvement in the water supply system. This approach can identify which smaller improvements can be actioned right away (e.g. exclusion of animals from a communal well area), and which larger improvements are required in the longer term once resources become available (e.g. the provision of a chlorine dosing system for the disinfection of the water supply).

Task 5: Monitor control measures and verify the effectiveness of the WSP

Confirm that the water supply is operating as it should be and that the WSP is protecting drinking-

> *Operational monitoring*: Routine monitoring performed to confirm that control measures are working to protect water safety at key steps along the water supply chain.
>
> *Verification monitoring*: Confirms that water quality targets or objectives are being achieved and maintained and that the system as a whole is operating safely and the WSP is functioning effectively.

water safety and public health. This may be achieved through **operational monitoring** and **verification monitoring**.

Part 1 – Operational monitoring: confirms that individual control measures are working as intended. Operational monitoring may involve quick and simple visual inspections as well as water quality testing to inform operational decisions. This task involves determining the **critical limits** (or target conditions) for appropriate monitoring parameters as well as **corrective actions** to take when critical limits are breached.

Example of an operational monitoring plan from a WSP for small water supplies:

Water supply system component	Monitoring or inspection activity		Limit value or critical condition	Corrective action required
Well	*What?*	• Fence • Water turbidity	• Fence damaged or broken • Turbidity above 5 turbidity units	Caretaker to: • Repair fence immediately • Removing any animals that may have entered the area • Close well access until turbidity drops below 5 turbidity units • Notify WSP team leader
	How?	• Visual inspection of the fence using the sanitary inspection form • Turbidity tube		
	When?	• Weekly visual inspection of the fence • Daily turbidity testing		
	Where?	On-site at the well		
	Who?	Caretaker		

Water supply system component	Monitoring or inspection activity		Limit value or critical condition	Corrective action required
Household	*What?*	Cleanliness of household storage container	• Dirty or damaged water storage container	Community liaison officer to:
	How?	Visual inspection	• Container used for multiple purposes (e.g. water storage, clothes washing etc.)	• Advise consumer on sanitary household water storage and handling practices
	When?	One household visit per week		• Notify WSP team leader
	Where?	On-site at household	• Container stored in insanitary way (e.g. on ground level, accessible to animals, children etc.)	
	Who?	Community liaison officer		

Part 2 - Verification monitoring: confirms that water quality targets are being achieved (e.g. drinking-water quality standards), the WSP is complete, up-to-date and being implemented, and that consumers are satisfied.

The three key actions for WSP verification monitoring:

Water quality testing, often by or for the health authority, to confirm compliance with water quality standards → **1 Compliance monitoring**

VERIFICATION

Checking that consumers are satisfied (and not turning to less safe alternatives) → **3 Consumer satisfaction**

2 Assessment ← *Can be:*

Internal assessment - such as a WSP team review, or

External assessment – such as a support visit to help ensure the WSP is current and being implemented effectively
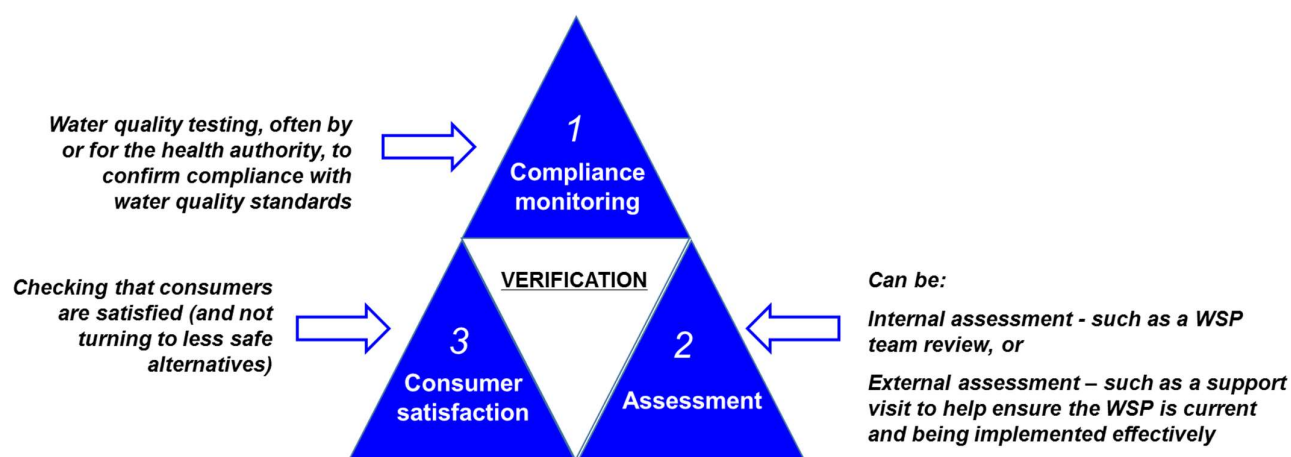
Task 6: Document, review and improve all aspects of water safety plan implementation

Document the status and the level of operation and management of the water supply system to ensure that the WSP approach is embedded in operations and that the WSP remains up-to-date and effective.

Part 1 – Document management instructions: Prepare step-by-step instructions for important operational and maintenance tasks that the operator of the system may easily follow (e.g. how to clean the spring box; how to maintain the chlorine dosing pump). Prepare guidance also for what needs to be done in case of an incident or emergency (e.g. in the event of contamination of the water supply).

Part 2 – Participate in supporting activities: Identify and provide activities to support and contribute to improved drinking-water supply operation and water safety. Examples include caretaker training and consumer education and awareness activities (e.g. an education programme for consumers on safe household water storage).

Part 3 - Regularly review the WSP: Review and, if necessary, revise the WSP regularly and following any incidents to ensure that the WSP is up-to-date and effective and that it reflects lessons learned.