

WATER REMEDIATION APPROACHES FOR DRINKING WATER SUPPLIES PART C: WATER SAFETY PLANS

The material presented here has been prepared by George Wilson in April 2021, with input from Dr. Laura Richards and Prof. David Polya of the Department of Earth & Environmental Sciences, The University of Manchester, and other sources as acknowledged. The associated video recordings have been made by George Wilson.

The Transformation by Innovation in Distance Education (TIDE) project is enhancing distance learning in Myanmar by building the capacity of Higher Education staff and students, enhancing programmes of study, and strengthening systems that support Higher Educational Institutions in Myanmar. TIDE is part of the UK-Aid-funded Strategic Partnerships for Higher Education Innovation and Reform (SPHEIR) programme (www.spheir.org.uk). SPHEIR is managed on behalf of FCDO by a consortium led by the British Council that includes PwC and Universities UK International. The TIDE project will close in May 2021.



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- Water safety plans (WSP) are an important public policy tool to accomplish water quality goals
- Adaptable to all types and sizes of water supply, can be applied to all socioeconomic settings
- Adapting the WSP framework to a particular setting is important

- Explain the purpose and function of water safety plans
- Become familiar with how water safety plans are developed and managed
- Become aware of the limitations of such plans

PURPOSE OF WATER SAFETY PLANS

Quote from WHO

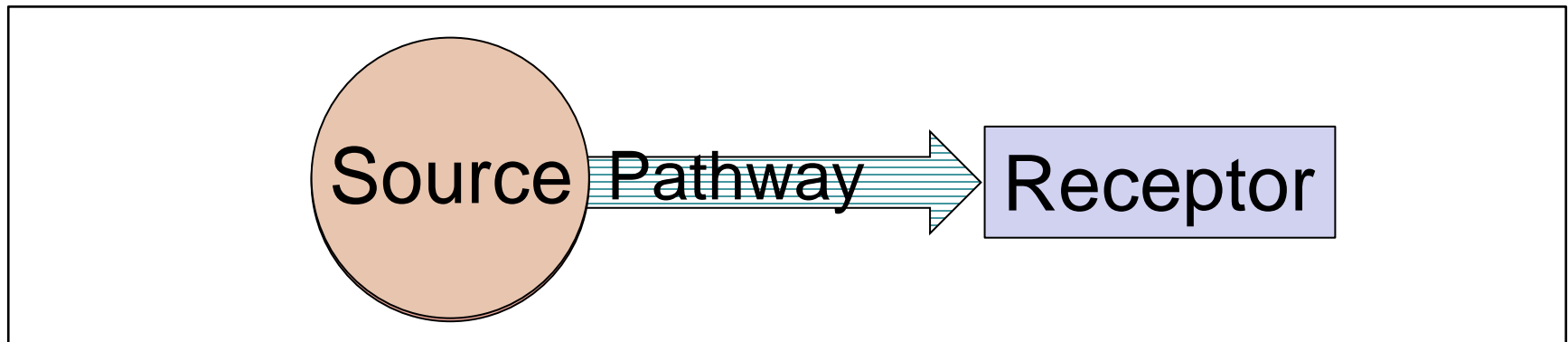
“The most effective means of consistently ensuring the safety of a drinking water supply is through the use of a **comprehensive risk assessment and risk management** approach that encompasses all steps in water supply from catchment to consumer” – WHO (2009)

Purpose of WSPs

- Prevent contamination of water from source to point of consumption
- Give consumers greater involvement in water quality issues

Understanding required of:

- Source(s) of contamination
- Pathway of contamination, along with any barriers
- Receptor of contamination



DEVELOPMENT AND MANAGEMENT OF WATER SAFETY PLANS

WSP development flowchart

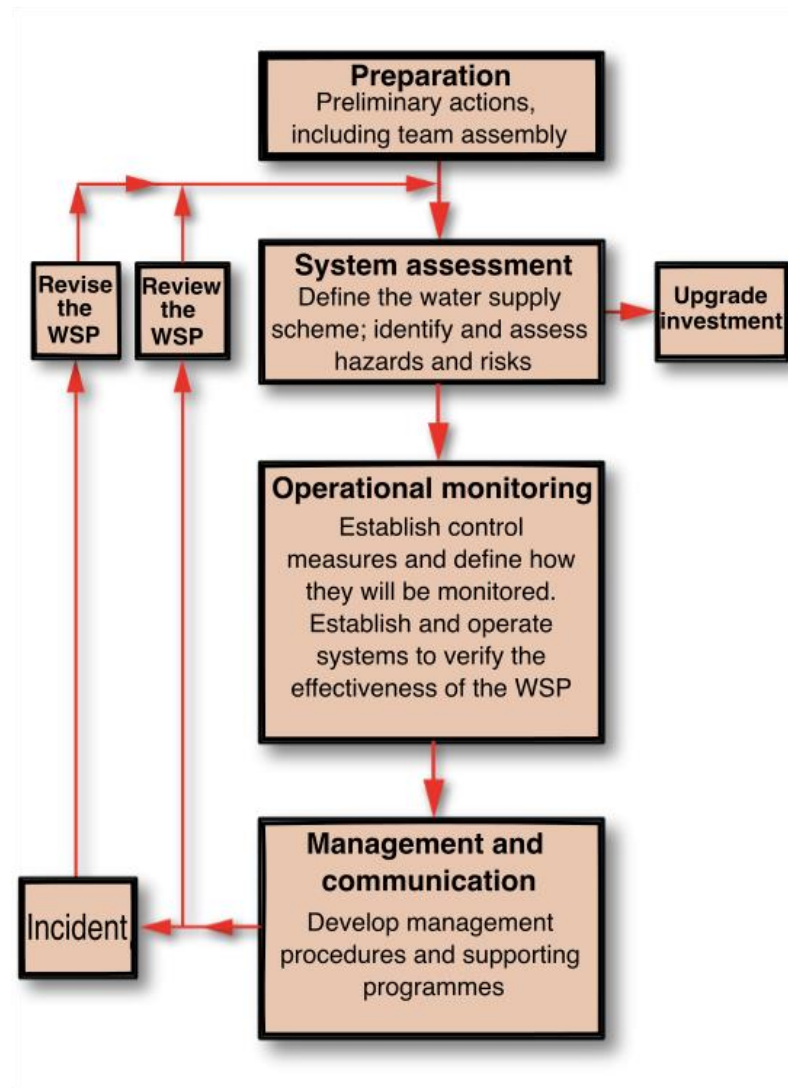


Figure produced by George Wilson
from an adaptation of WEDC (2017)

- Identify suitable personnel with relevant experience
- Identify stakeholders
- Source sufficient resources and finances

- Identification of hazards and hazardous events
- Assessment of possible risks

Risk = frequency x severity

- Identify **control points** – steps at which a water safety hazard is reduced to an acceptable level
- Identify **control measures** – actions that can be used to reduce a water safety hazard to an acceptable level
- **Monitoring** – assuring compliance of physio-chemical and sanitary risk factors to operational limits
- **Verification** – compliance of monitoring programme verified with microbiological techniques

(WHO, 2019)

- Management procedures are documented and communicated to relevant operating staff
- Procedures should be reviewed and staff informed, following any emergency
- Training, research and development for water supply staff/consumers/members of the community
- Education of the general public

- 1) A national conference resulted in stakeholder firm commitment to WSPs
- 2) Work undergone to develop WSPs on:
 - Dug wells
 - Pond sand filters
 - Rainwater harvesters
 - Shallow/deep tubewells
 - Piped water systems from various sources
- 3) Analysis of likely hazards and risk assessment
- 4) Development of community monitoring tools
- 5) Pilot projects
- 6) Community training

(Mahmud, 2007)

LIMITATIONS OF WATER SAFETY PLANS

- Only as good as the information available and how effectively they are planned and implemented
 - Quality of supplied water does not necessarily correspond to the quality of drinking water used by the end-user (Mondal *et al.*, 2004)
- Cannot address water *quantity* issues (WEDC, 2017)

SUMMARY

- Water safety plans are used to accomplish water quality goals through risk assessment and risk management
- Water safety plans are only as good as the information available and do not address water quantity problems

LEARNING EXERCISE

Learning exercise

Study this image.
Describe how
groundwater
contamination could
reach the end-user.
There are many
possible answers here.

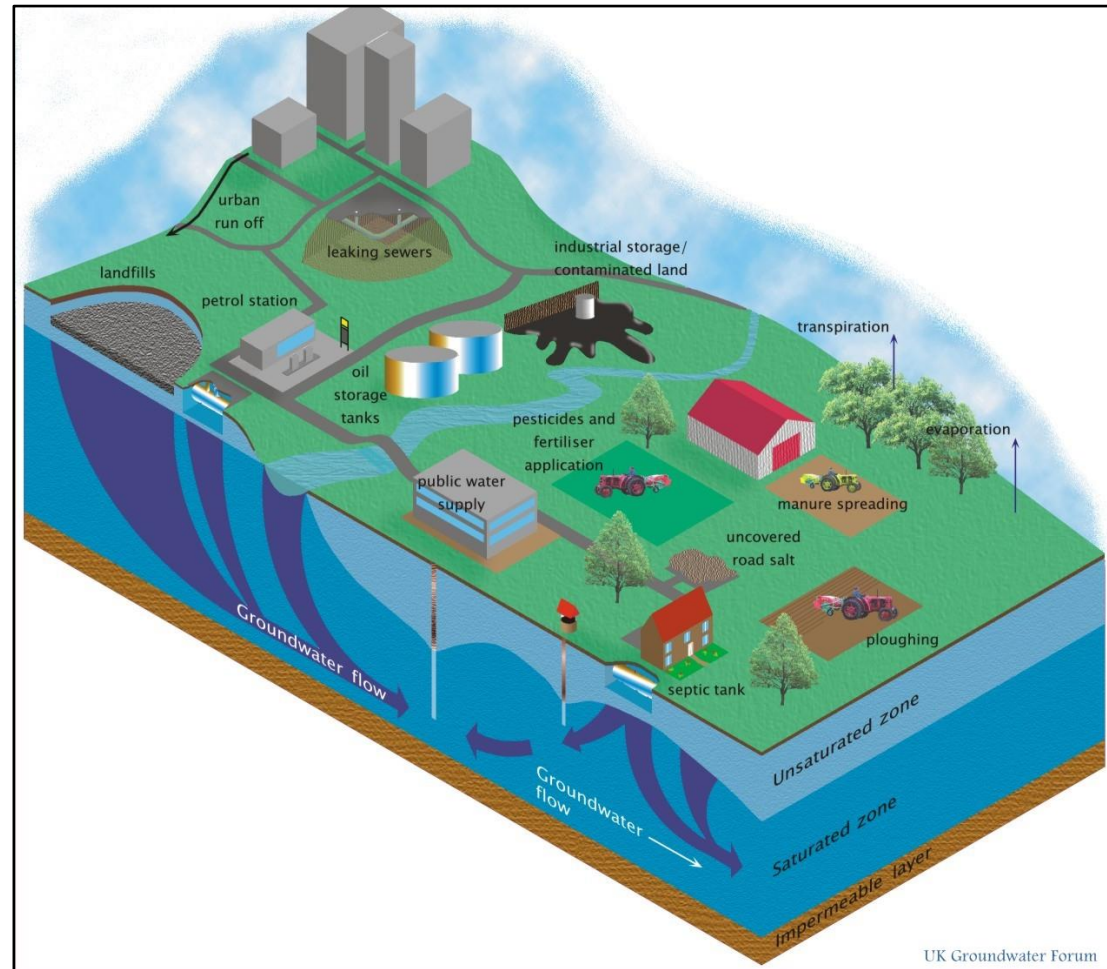


Image from UK Groundwater Forum
(2011) under public domain license

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