

**WSP AUDIT
FOR
GELEPHU THROMDE**

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|---|---|
| Name of water supply company: Gelephu Thromde | Audit dates: 24/4/2024-26/04/2024 |
| Audit objective (tick all that apply): <input checked="" type="checkbox"/> To provide support to the WSP team to improve the WSP <input checked="" type="checkbox"/> To check that the WSP is complete, up-to-date and implemented in practice <input type="checkbox"/> Organizational quality assurance <input type="checkbox"/> To prepare for an external audit (external audit dates: _____) <input checked="" type="checkbox"/> Regulatory compliance <u>Other:</u> | Type of audit: <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External <input type="checkbox"/> Informal <input checked="" type="checkbox"/> Formal |

Audit team member names and positions:

1. Pema Chopel (Lead auditor, RCDC, DCLO)
2. Chimmi Dorji (HEAD, RCDC)
3. Amin Ngawang Tashi (RCDC, Chief Scientist and certified auditor)
4. Sonam Gyeltshen (RCDC, Sr. Laboratory Technician and certified auditor)
5. Pema Yuden (DoW, MoENR, GIS Officer)
6. Sonam Tshering (Gelephu CRRH, Laboratory Technician)
7. Tashi Wangchuk (Samdrupjongkhar Hospital, Laboratory Officer)
8. Singay Jamtsho (Wangduephodrang Hospital, Sr. Laboratory Technician)
9. Dawa Zangmo (Wangduephodrang Hospital, Laboratory Technician)

Main WSP team contact person during audit (name and position):

Karma Tenzin (Engineer, O & M, WSS)

Field sites visited during the audit (list all sources, WTPs, storage tanks, etc.):

1. Passang chhu
 - ✓ Source,
 - ✓ Water treatment plant
 - ✓ Storage tank
2. Mao chhu
 - ✓ Water treatment plant and storage tank
3. Borewell
 - ✓ Source and storage tank

Main strengths:

1. Comprehensive WSP document updated (2013, 2015, February 2021 and August 2021)
The Water Safety Plan (WSP) for Gelephu has been updated multiple times (2013, 2015, February 2021, and August 2021), which shows a commitment to continual improvement of WSP. By keeping the WSP current, the Thromde ensures that water safety processes and protocols are effective, thereby minimizing the risk of water contamination to protect public health.
2. Good representation of WSP Team
The WSP team includes members from all important relevant sectors, including top management. This multidisciplinary approach ensures that the WSP addresses a wide range

of potential risks and solutions, including diverse perspectives and expertise. Involving top management also helps in ensuring that water safety is prioritized at the highest level of the organization, facilitating the allocation of necessary resources and the effective implementation of the WSP.

3. Most of the hazards were identified and some corrective actions were implemented (for 2013, 2015 and 2021 WSP)

By addressing hazards identified in the 2013, 2015, and 2021 updates of the WSP, the organization shows its proactive actions on risk management. Implementing corrective actions not only mitigates identified risks but also improves the reliability of the water supply system, ensuring safer drinking water supply for consumers.

4. Data maintained till consumer level for some parameters (Operation monitoring)
Maintaining data till consumer was another strength of the existing system which ensures robust operation monitoring. This step is important because it allows for tracking of water quality and system performance, extending beyond treatment facilities and distribution networks to the point of use. This can help in taking timely corrective actions, thus safeguarding consumer health.
5. E. Coli not detected in treated water during auditing.
The absence of E. Coli in treated water, despite contaminated source, during the auditing indicates effective treatment processes. Presence of E. Coli indicates fecal contamination and possible presence of pathogens.
6. Regular compliance monitoring of water supply system.
The data from Gelephu CRRH indicates regular monitoring of critical parameters of drinking water which ensures compliance of drinking water supplied to the public.

Main improvement opportunities:

1. Need to update the WSP team to the current list.
Although most of the relevant organizations are included in the list, the list is not current and needs update to ensure responsibilities are clearly assigned and members are aware of their roles, facilitating effective management and quick responses to water safety issues.
2. Update WSP including all water sources.
Currently WSP exists only for three sources namely, Passang chhu, Mou chhu and borewell. As WSP plays an important role in the provision of safe drinking water, inclusion of new water supply from Bali chhu (Phulari water treatment plant) is needed to complete all water supply systems.
3. There is a need to refer to the National standard (Bhutan drinking water quality standard 2016) in place of WHO guideline.
Currently in the existing WSP, the reference is given only for WHO guidelines. However, there is a need to adapt Bhutan drinking water quality standard 2016 to ensure compliance with national standards and to ensure specific local water quality challenges more effectively.
4. Household practices should be clearly defined in WSP including cleaning practices.
Clearly defining household practices, especially cleaning and storage of drinking water, in the WSP helps ensure that the end users maintain the integrity of water quality after it has been distributed. This can include guidelines or SOPs on how to properly store water and clean storage containers.

5. Treatment system should not be bypassed.
Treatment of water supply is one of the critical stages of ensuring safe water supply. As shown in figure 1, the water supply was by-passed from the existing water treatment system (sand filter). By passing can lead to untreated or partially treated water reaching consumers, posing significant health risks.



Figure 1 Filtration system not used for treatment (due to blockage) and by passed

6. Clearing down the fruiting trees around the water intake to prevent source contamination by wild animals (monkeys).
One of the hazards identified at the source was fruiting trees (Figure 2) which could potentially attract wild animals particularly Monkeys that contaminates the water source as fecal contamination was observed at the source.

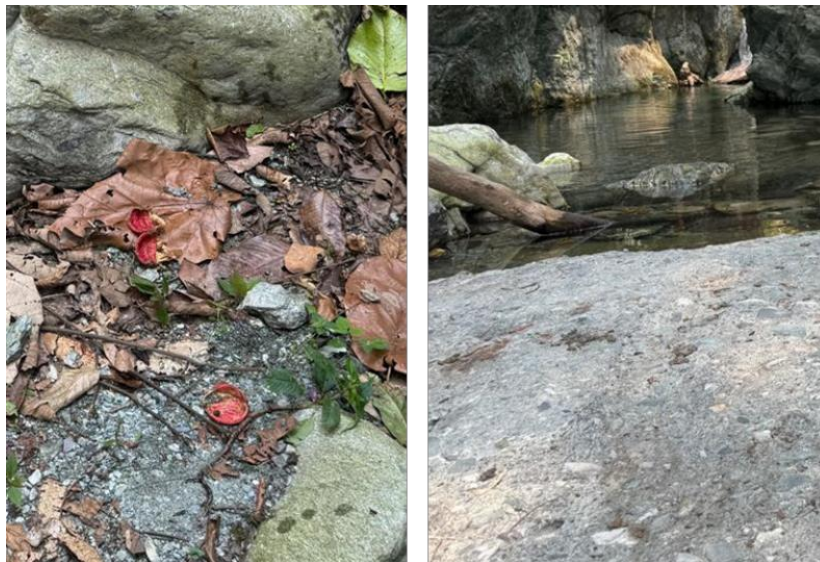


Figure 2 Fruit bearing trees at the source and animal feces seen at the water source.

7. Need to update improvement plans status.
In the current WSP improvement plan status has not been updated. Regularly updating the status of improvement plans makes it easier to track progress and address any delays or issues promptly. This also helps in maintaining momentum and accountability in implementing necessary improvements.

8. Operational monitoring frequency not defined as per national standard (BDWQS 2016). It is important to define and adhere to a specific frequency for operational monitoring as specified in national standard (BDWQS), such as residual chlorine should be monitored daily instead of weekly or alternate days.
9. Continue and improve maintaining data for operational monitoring.
The existing system of operational monitoring is commendable. However, there is a need for enhanced data collection and management for operational monitoring more frequently (daily instead of in alternate days) that will enable water suppliers for more precise control over water quality and immediate response to anomalies. Improving these processes can lead to better decision-making and more effective water management strategies.
10. For compliance monitoring, there is a need to include water samples from all water sources. the current compliance monitoring system although covers most of the vulnerable population, there is need to incorporate sampling from new water source supplied from (Phulari water treatment plant)
11. There is need to improve the existing SOPs and users should be effectively trained (eg. SOP for chlorination).
In the current WSP, the SOPs are not up to date and updated and users must be trained on using that SOPs (eg. caretakers are not properly trained on adding bleaching for disinfection). This will ensure that all personnel are competent and procedures are performed consistently to enhance operational efficiency and safety.
12. Pipeline punctured to release air should be sealed.
Some of the pipelines are punctured to release air. However, these punctured pipelines must be properly sealed to prevent potential entry points for contaminants and maintain the integrity of the water distribution system.
13. E. Coli detected in Samdrupling borewell.
One of sample at Samdrupchholing borewell was found contaminated with E. Coli indicative of contamination of water supply. This shows the disinfection is not proper or there are sources of contamination. This calls for immediate action to identify the source of contamination, eliminate it, and prevent future occurrences through WSP and remedial actions.
14. Need for proper disinfection.
Proper and consistent disinfection practices must be enforced and must maintain residual chlorine throughout the system to eliminate pathogens from the water supply, ensuring the water remains safe for consumption.
15. Emergency contacts should be current along with a plan for responding to the emergency.
The existing emergency contacts are not current and some of the members are changed. Therefore, there is a need to keep emergency contact information current and having a clear, actionable plan for responding to emergencies are essential for effective crisis management.
16. All the supporting programs should be based on audit feedback.
Using audit feedback to guide supporting programs ensures that these initiatives address actual deficiencies and improvement areas identified during audits.
17. Need to provide water safety awareness programs to the consumers.

Educating consumers about water safety, proper handling, and risk prevention contributes to overall water quality and safety, as consumers learn how to avoid contamination at the point of use.

18. Need to perform internal auditing and documented.

Although the team mentioned having internal auditing on a few occasions, the meetings were not documented. Regular internal audits and thorough documentation are important for maintaining compliance, identifying areas for improvement, and ensuring that the WSP is effectively implemented.

19. Ensure availability of reagents for daily operational monitoring.

Currently the reagents purchased are of limited quantity which can be expensive and lead to inconsistent supply of reagents for testing, particularly for testing residual chlorine. There is a need to establish a system which ensures consistent availability of necessary reagents and testing materials that supports continuous monitoring and uninterrupted testing facilities.

20. Explore and adopt a permanent source.

The existing source from Passang chhu was found to have inconsistent water supply as the intake gets washed away during heavy rain, having to change the whole intake system after the rainy season. Finding and using a permanent source of water, if feasible, can reduce the need to switch sources seasonally, thereby simplifying treatment and monitoring processes and potentially improving water quality.

21. Sharing of water quality data with Thromdes.

While data for compliance monitoring is being shared with Thromde, the auditors emphasize on sharing water quality data between Thromdes and MoH to enhance transparency, allowing for better coordinated response efforts, and improves public trust in water management practices.

Implementation plan

| | What should be done? | Who is responsible? | By when should it be done? |
|----|--|--|----------------------------|
| 1 | Need to update the WSP team to current list | WSP Team | 1st week of May 2024 |
| 2 | Update WSP including all water sources | WSP Team and MoIT (supported by RCDC) | By October 2024 |
| 3 | There is need to refer to National standard (Bhutan drinking water quality standard 2016) in place of WHO guideline. | WSP Team | 1st week of May 2024 |
| 4 | Treatment system should not be by passed | WSP Team | By May 2024 |
| 5 | household practices should be clearly defined in WSP including cleaning practices. | WSP Team (water meter readers/social media) | Immediately |
| 6 | Clearing down the fruiting trees around the water intake to prevent source contamination by Wild animal (Monkey) | WSP Team | By May 2024 |
| 7 | Pipeline punctured to release air should be sealed | WSP Team | By 1st week of May 2024 |
| 8 | There is need to update improvement plans status | WSP Team | 1st week of May 2024 |
| 9 | Operational monitoring frequency not defined as per national standard (BDWQS 2016). Eg. Residual chlorine should be monitored daily. | WSP Team | Mid June 2024 |
| 10 | Continue and improve maintaining data for operational monitoring. | WTP technician | Daily |
| 11 | For compliance monitoring, there is need to include water samples from all water sources. | Gelephu CRRH | Monthly |
| 12 | There is need to improve the existing SOPs and users should be effectively trained (eg. SOP for chlorination). | WSP Team (lead) and RCDC (support) | By December 2024 |
| 13 | Emergency contacts should be current along with plan for responding the emergency | Thrompon/ IDD Chief engineer/water engineer/concerned caretakers | By 1st week of May 2024 |
| 14 | All the supporting programs should be based on audit feedback. | WSP Team | By 1st week of May 2024 |
| 15 | Need to provide water safety awareness program to the consumers. | WSP Team (social media/water meter readers) | By 1st week of June 2025 |

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| 16 | Need to perform internal auditing and documentation | WSP Team (implement internal informal audit by Thomde followed by MoIT to conduct internal formal audit as per Thomde's request) | By June 2025 |
| 17 | Ensure availability of reagents for daily operational monitoring. | WSP Team | Mid June 2024 |
| 18 | Explore and adopt a permanent source (no need to change source in winter and summer) | WSP Team | By December 2025 |
| 19 | Sharing of water quality data with Thomdes | RCDC | By December 2024 |
| 20 | Hospital lab to collaborate and communicate water quality data with Thomde | Gelephu CRRH | Monthly |

Attachments:

- List of all audit participants
- Audit plan
- Completed scoring form
- Other:

Communication:

- Audit report has been shared with the water supplier

Confirmed receipt:

Water supplier representative (sign and print name)

Pema Chophel,
 Certified WSP Auditor,
 Water and Environment Laboratory,
 Royal Center for Disease Control,
 Ministry of Health.

Lead auditor (sign and print name)

SCORING FORM

| WATER SUPPLIER INFORMATION | |
|---|-------------------------------------|
| Information requested below should be provided for the water supply system(s) covered by the WSP being audited. | |
| WATER SUPPLIER NAME | Gelephu Thromde |
| TOWN(S) SERVED | Gelephu |
| NUMBER OF PEOPLE SERVED | 817 (WSP 2021) |
| PRIMARY SUPPLIER CONTACT DURING AUDIT | Karma Tenzin (Engineer, O & M, WSS) |
| MONTH/YEAR WSP IMPLEMENTATION BEGAN (when WSP began to influence the actions of the supplier, e.g. introduction of changes to management procedures or monitoring practices, implementation of control measures to manage risks) | October 2013 |

| AUDITOR INFORMATION | |
|-------------------------|---|
| DATE | 24/4/2024 to 26/04/2024 |
| AUDITOR NAME(S) | Pema Chopel, Chimmi Dorji, Amin Ngawang Tashi, Sonam Gyeltshen, Pema Yuden, Sonam Tshering, Tashi Wangchuk, Singay Jamtsho, Dawa Zangmo |
| AUDITOR ORGANIZATION(S) | RCDC (MoH), DoW (MoENR), Gelephu CRRH (MoH), Samdrupjongkhar Hospital (MoH), Wangduephodrang Hospital (MoH) |

1. WSP TEAM

Objective: assemble an appropriate team of professionals with knowledge and experience in all aspects of the water supply system and sufficient decision-making authority to develop and implement the WSP.

| Question | | Tips for auditor and scoring guidance | Score (0–4) | Comment/justification |
|----------|--|--|-------------|---|
| 1.1 | Is there a documented WSP team and is the team list current? | Ask WSP team to make a list of current WSP team members (ideally without referring to the WSP). Compare this list with the WSP team list documented in the WSP. Score 4 only for a perfectly up-to-date list; score 2 for one member out of date (new member not added or resigned member not deleted); score 0 for two or more team members out of date or no documented WSP team list. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations.) | 1 | Documented but more than 2 members out of date. |
| 1.2 | Are appropriate organizations represented on the team? | Appropriate persons often include representatives of the health or environment sectors in addition to water supplier staff. Based on knowledge of optimum team composition (drawing on experience elsewhere in the country), auditor should score 4 for a fully complete team; score 2 for a team with one key organization missing; score 0 for a team with two or more key organizations missing. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations.) | 4 | Appropriate organizations are represented |
| 1.3 | Does the team include people with the authority to carry out WSP recommendations as well as technical staff? | The WSP team should include those with authority in matters related to budget and operations, for example. A balanced WSP team should also include technical staff to capture inputs and ensure awareness and buy-in. Score 4 for a well-balanced team with technical and management-level staff; score 2 for a team with one key position/discipline missing (e.g. either no technical staff or no managers); score 0 for a team with two or more key positions/disciplines missing. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations.) | 4 | Team includes people with authority to carry out WSP. |

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| 1.4 | Is there evidence that regular team meetings held and recorded? | Is the WSP team able to furnish evidence, e.g. meeting minutes, that WSP team meetings are held at the frequency indicated in the WSP? Auditor should review these records for the audit period (or for a period of at least one year). Score 4 only if target frequency is documented in the WSP and there is evidence that meetings are held at this frequency; score 2 if there is partial evidence that meetings are held at least six-monthly (or at the target frequency in WSP); score 0 if there is no evidence of regular WSP team meetings. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations.) | 0 | No evidence of regular WSP meeting. |
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2. SYSTEM DESCRIPTION

Objective: thoroughly describe the water supply system to demonstrate complete system understanding and inform the risk assessment.

| Question | Tips for auditor and scoring guidance | Score (0–4) | Comment/justification | |
|----------|---|---|-----------------------|--|
| 2.1 | Are intended users/uses of the water supply defined? | The WSP should indicate how the water supply is to be used (e.g. drinking directly, drinking only after household treatment, not for drinking) and by whom. Score 4 if both intended users and uses of the water supply are clearly defined in the WSP; score 2 if either intended users or uses are missing; score 0 if both are missing. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations, e.g. definitions included but unclear or incomplete.) | 4 | Intended users and uses of water supply is clearly defined. |
| 2.2 | Are drinking-water quality standards or targets described? | Does the WSP include the nationally relevant water quality standards or targets that the water supply must meet? A general reference to WHO guidelines is not sufficient. Score 4 if standards/targets are fully defined in the WSP (or a relevant national document is thoroughly/accurately referenced); score 2 if this requirement is partially addressed in the WSP; score 0 if there is no reference to standards in the WSP. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations, e.g. standards included but out of date.) | 1 | There is no reference to National standard (Bhutan Drinking water quality standard 2016) |
| 2.3 | Are clear, accurate and up-to-date maps | Follow the flow of water from catchment to consumer on the schematics/maps to confirm clarity and consistency. Field verify the information provided and note any errors or inconsistencies. Also, | 2 | Water bypassed from filtration. |

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| | and/or schematics of the complete water system included? | discuss the schematic details with staff and ask them if there have been any changes. Score 4 if maps/schematics are detailed, clear, complete, accurate and fully up to date; score 2 if included but not fully clear, complete, accurate or up to date; score 0 if not included. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations.) | | |
| 2.4 | Are all major steps in the water supply chain described? | Accurate information on the catchment, treatment and storage facilities, distribution system and household-level practices should be provided. Score 4 if all steps are thoroughly and accurately described (including household practices where household storage and/or treatment are required, e.g. because of tap stand use or intermittent supply to homes); score 2 if one major step is missing; score 0 if two or more major steps are missing. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations, e.g. steps are included but inadequately or inaccurately described.) | 2 | Described but not clearly defined for household practices. |

3. HAZARD IDENTIFICATION AND RISK ASSESSMENT

Objective: identify hazards/hazardous events and assess related risk to water safety to determine if improvements are needed.

| Question | | Tips for auditor and scoring guidance | Score (0–4) | Comment/justification |
|----------|---|---|-------------|--|
| 3.1 | Has the risk assessment approach been clearly described? | The WSP should clearly describe the method and basis for the risk assessment, including key terminology and definitions (e.g. how likelihood and severity are defined). Score 4 if the risk assessment methodology is clearly and thoroughly defined in the WSP; score 2 if partially defined (e.g. if key definitions are missing or incomplete); score 0 if not defined. (Scores 1 and 3 can be assigned at auditor’s discretion for in between situations.) | 4 | The risk assessment methodology is clearly defined. |
| 3.2 | Have all significant hazards been identified at all major steps? | Based on discussions with the WSP team and field visits, determine if all important hazards/hazardous events have been documented. Score 4 if all major hazards have been identified and documented for each step in the water supply chain; subtract one point for each significant hazard that in the auditor’s estimation should have been considered/documentated and was not (down to a minimum score of 0). | 3 | Not all hazards are identified (eg. Fruit bearing tree near source attracting wild animals (monkeys) and contaminating the source) |

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| 3.3 | Have existing control measures been identified and validated? | Ensure that the risk assessment considers controls that are already in place and whether or not those existing controls are capable of mitigating the risk. ('Validation' is the process of confirming the effectiveness of existing controls and is an important step in determining if additional controls are needed.) Score 4 if existing controls are documented and validated for all hazardous events; score 2 if existing controls have been documented but not validated; score 0 if existing controls have not been documented. (Scores 1 and 3 can be assigned at auditor's discretion for 'in between' situations.) | 4 | Existing controls are documented and validated for all hazardous events. |
| 3.4 | Have risks been logically and systematically assessed for all hazards identified? | Confirm that the risk assessment indicates a clear understanding of the risk assessment methodology and that the risk scoring is clear, consistently applied and logical. Score 4 if the complete risk assessment is clear, consistent and logical; score 0 if the risk assessment is significantly unclear, inconsistent or illogical and/or suggests that the WSP team does not have a clear understanding of the risk assessment process. (Scores 1, 2 and 3 can be assigned at auditor's discretion for 'in between' situations.) | 2 | Some hazards are not assessed (eg. Pipeline punctured to release air are not closed later, by passing filtration at treatment plant) |

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| 3.5 | Is it clear which hazards require additional control or improvement? | Confirm that the risk assessment clearly indicates which hazards require additional control (or improvements). Any additional controls needed should be clearly separated from the existing controls documented. Score 4 if there are no challenges in determining which hazards require additional control; score 2 if it is somewhat unclear which hazards need more control (e.g. existing and proposed controls are mixed together); score 0 if it cannot be determined from the risk assessment which hazards require additional control. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations.) | 3 | Source protection requires additional control measures (cutting down fruiting trees). Not bypassing filtration at treatment plant. |
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4. IMPROVEMENT PLAN
Objective: plan improvements based on system needs and priorities identified through the risk assessment process.

| Question | Tips for auditor and scoring guidance | Score (0–4) | Comment/justification | |
|----------|---|---|-----------------------|--|
| 4.1 | Has an improvement plan been developed that is clearly linked to the risk assessment process? | There should be a clear and direct link between the risk assessment and the improvement plan. All improvements identified in the plan should follow directly from the risk assessment process. Score 4 only if the following two conditions are met: a) an improvement has been proposed for each significant risk requiring additional control, and b) each improvement in the plan is clearly and directly linked to the risk assessment; score 2 if the link between the risk assessment process and the improvement plan exists but is not fully clear and direct; score 0 if there is no clear link between the risk assessment and the improvement plan, or if there is no improvement plan. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations.) | 4 | Improvement has been proposed for each risk requiring additional control and each improvement is clearly and directly linked to the risk assessment. |

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| 4.2 | Does the improvement plan describe the action, responsible party, cost, funding source and due date? | The improvement plan should be specific to facilitate action. Score one point for each of the following categories of information included in the improvement plan (provided that meaningful information has been provided for each category): 1) action to be taken; 2) responsible party; 3) cost and/or funding source; and 4) target due/completion date. (If no improvement plan, score 0.) | 4 | The improvement plan is comprehensive and includes all critical components. |
| 4.3 | Is the improvement plan being carried out as documented and kept up to date? | Look for evidence that improvements are being made as per the defined schedule. The improvement plan is of little use if it is not being implemented. Talk through the full improvement plan with the WSP team to gauge the degree of implementation. Also look for evidence that the plan is revisited and revised by the WSP team, e.g. that completed works are marked as complete or that new schedules have been defined for lapsed deadlines. Score 4 only where all works are being implemented as described in the schedule and where completed work are marked as complete or removed from the improvement schedule; score 2 where works are generally being implemented as described but where there are a couple of lapsed deadlines or where completed works have not been marked; score 0 where the improvement plan is generally out of date and not being followed, or there is no improvement plan. Scores 1 and 3 can be assigned at auditor's discretion for "in between" situations.) | 2 | There are a couple of lapsed deadlines or where completed works have not been marked. |

5. OPERATIONAL MONITORING

Objective: describe monitoring to be carried out by the supplier (visual inspections and water quality testing) to ensure that key water supply system components and control measures continue to work effectively.

| Question | | Tips for auditor and scoring guidance | Score (0–4) | Comment/justification |
|----------|---|---|-------------|--|
| 5.1 | Has an operational monitoring plan been documented, addressing routine water quality monitoring and visual inspections by the supplier? | <p>This addresses operational monitoring by the supplier to confirm control measure effectiveness, and it is distinct from compliance monitoring by health officials to confirm that health-based standards or targets are being met (which is covered in the next section – 6. Verification). Ideally, the operational monitoring plan should cover visual inspections, e.g. checking fences, storage tanks, spring boxes, etc., as well water quality testing by the supplier. Where possible, the supplier should monitor water quality at appropriate locations to inform operational decisions, e.g. monitoring raw, settled or filtered water. This is especially critical where treatment chemicals are being used, such as alum or chlorine. If an operational monitoring plan has not been documented to cover water quality testing and/or visual inspections by the supplier, score 0. Where a documented plan exists, score one point for each of the following elements:</p> <ul style="list-style-type: none"> • parameters (e.g. turbidity, pH, chlorine) and/or control measures/components to be monitored (e.g. fences) • monitoring locations and frequency • responsible party • target conditions and/or critical limits and corrective actions if critical limits are breached. | 3 | Operational monitoring frequency not defined as per national standard (BDWQS 2016) |

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| 5.2 | Is the supplier carrying out operational monitoring as per the documented plan? | Review monitoring records, e.g. water quality logbooks and site inspection checklists for the audit period (or for a period of at least one year) to confirm that operational monitoring is being conducted by the supplier as per the plan. Score 4 only where complete records clearly indicate full compliance with the monitoring plan; score 2 where available records indicate general compliance with the schedule but where there are gaps in records; score 0 where no records exist to confirm compliance with the monitoring plan or where there is no plan for operational monitoring by the supplier. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations.) | 1 | Not performed as per the WSP. Residual chlorine testing |
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6. VERIFICATION

Objective: confirm that drinking-water quality standards are being met, consumers are satisfied and the WSP is complete and effective.

| Question | Tips for auditor and scoring guidance | Score (0–4) | Comment/justification | |
|----------|---|---|-----------------------|--|
| 6.1 | Has a compliance monitoring plan been documented? | The compliance monitoring plan is generally developed as a collaboration between health officials and the water supplier. Compliance monitoring is distinct from operational monitoring by the supplier (covered in the previous section – 5. Operational monitoring). It covers the water quality monitoring required to determine compliance with health-based water quality standards or targets. If a compliance monitoring plan has not been documented, score 0 . Where a documented plan exists, score one point for each of the following elements: <ul style="list-style-type: none"> • parameters monitored (e.g. <i>E. coli</i>) and relevant standard or target for each parameter • monitoring locations • monitoring frequency • responsible party. | 3 | Sampling point not representative of water from all sources. |

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| 6.2 | Is compliance monitoring being carried out as planned? | Review water quality records for the audit period (or for a period of at least one year) to confirm that compliance monitoring is being conducted as planned. No monitoring (or no records) may indicate insufficient communication between water supplier staff and health sector members of the WSP team. Score 4 only where complete records clearly indicate full compliance with the monitoring plan; score 2 where available records indicate general compliance with the schedule but where there are gaps in records; score 0 where no records exist to confirm compliance with the monitoring plan or where there is no plan for compliance monitoring. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations.) | 3 | There are few delays or non-compliance with compliance monitoring frequency. |
| 6.3 | Are water quality standards or targets being met? | Do compliance monitoring records indicate that water quality targets are being achieved? If not, the WSP is not achieving one of its primary objectives. The auditor should review available water quality records for the audit period (at least one year) and calculate compliance rates for key water quality indicators, e.g. faecal coliforms. Score 4 where records indicate >95% compliance with standards; score 3 for 85–95% compliance; score 2 for 75–85%; score 1 for 65–75%; score 0 for ≤65%. (If no water quality records are available, score 0 .) Where there is documented evidence of corrective action by the supplier during non-complying events, the auditor should add one point to the breakdown above (with a maximum score of 4). For instance, 70% compliance with regular, documented corrective action by the supplier during non-complying events would score 1 + 1 = 2. | 1 | (65% compliance in 2023) |

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|-----|--|---|---|---|
| 6.4 | <p>Does the supplier have a documented and implemented system for regularly monitoring and recording consumer satisfaction?</p> | <p>The WSP should define a system for regularly monitoring consumer satisfaction, e.g. customer surveys or complaints logs, and the supplier should be able to furnish evidence that the system is implemented in practice. Score 4 if the supplier has clearly defined and documented a system of monitoring consumer satisfaction and can furnish thorough evidence that the system is implemented; score 2 where the supplier has developed and regularly implements a system of consumer satisfaction monitoring but where there are some gaps in documentation and record; score 0 where no documentation or records of consumer satisfaction monitoring exist, or no system has been defined. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations.)</p> | 0 | <p>No documents for consumer satisfaction monitoring are available.</p> |
| 6.5 | <p>Has a plan for internal WSP auditing been defined and is it being implemented?</p> | <p>The WSP should define the frequency of internal audits and the WSP team should be able to furnish evidence that internal audits are being conducted at the frequency indicated in the WSP. (The auditor should make this guidance note available to WSP teams to use for internal auditing.) Score 4 only if target internal audit frequency is documented in the WSP and there is evidence that internal auditing is carried out at this frequency; score 2 if there is partial evidence that an internal audit has been conducted during the audit period; score 0 if there is no evidence of internal auditing. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations.)</p> | 1 | <p>Documented but not implemented.</p> |

7. MANAGEMENT PROCEDURES

Objective: define procedures to be followed during routine operations and emergency situations.

| Question | | Tips for auditor and scoring guidance | Score (0–4) | Comment/justification |
|----------|---|---|-------------|---|
| 7.1 | Have standard operating procedures (SOPs) been defined for major operational activities? clear | Based on the experience and site knowledge acquired during the audit, the auditor should be able to make a general list of key operational activities for which SOPs should be developed (e.g. filter backwashing, coagulant dosing, chorine dosing, storage tank cleaning, pipeline repair and replacement, equipment calibration, etc.). The auditor should make this list with WSP team members and review evidence that these SOPs have been developed. Score 4 if the supplier has developed clear and detailed SOPs for the majority of the key operational activities listed by the auditor; score 2 where the supplier has developed SOPs for many of the activities on the list and/or where the level of detail is not sufficient to guide field staff; score 0 where few or no detailed SOPs exist. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations.) | 3 | SOP developed but clearly defined (eg. SOP for chlorination) |
| 7.2 | Are SOPs up to date and accessible to field staff? | The auditor should review a sample of the supplier’s SOPs in detail with the WSP team to gauge whether or not they are generally accurate and up to date. In addition, the auditor should determine whether or not the SOPs are easily accessible to field staff for their use and reference. (SOPs that exist only at the head office are of little use to field staff.) Score 4 if all sample SOPs reviewed are up to date and easily accessible to relevant field staff; score 2 if there are minor issues with SOP updating/accuracy or accessibility; score 0 if SOPs are significantly out of date, inaccurate or inaccessible or if documented SOPs do not exist. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations.) | 1 | Not accessible to the field staff (eg. SOP for doing chlorination). SOPs are not upto date |

| | | | | |
|-----|--|--|---|---|
| 7.3 | Does the WSP include a current emergency response plan? | <p>The WSP should include a documented emergency response plan describing water quality emergencies that would trigger implementation of the plan, as well as communication protocols and up-to-date contact information. If an emergency response plan has not been documented, score 0. Where a documented plan exists, score one point for each of the following elements:</p> <ul style="list-style-type: none"> • a list of water quality incidents or emergencies that would trigger plan activation; • current names, positions and contact details of persons within the water supplier to be notified (no point given for outdated contact information); • current names, positions and contact details of health officials to be notified (no point given for outdated contact information); and • plan for disseminating emergency messages to consumers. | 2 | Not all incidents are covered (no water) Names are not current. plan for disseminating emergency messages to consumers not available. |
|-----|--|--|---|---|

8. SUPPORTING PROGRAMMES

Objective: identify programmes that indirectly support water safety.

| Question | Tips for auditor and scoring guidance | Score (0–4) | Comment/justification | |
|----------|---|--|-----------------------|---|
| 8.1 | Have appropriate supporting programmes been clearly defined? | Based on the experience and site knowledge acquired during the audit, the auditor should be able to make a general list of supporting programmes that should be included in the WSP, generally including operator training and consumer education as a minimum. Score 4 if the supplier has clearly defined all relevant supporting programmes, including implementation details; score 2 where the supplier has vaguely defined all relevant supporting programmes or has clearly defined only some of the key supporting programmes; score 0 where few or no supporting programmes are defined. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations.) | 1 | No prior audit feedback to provide general list of supporting programs. |
| 8.2 | Are supporting programmes being implemented as planned? | The supplier should be able to furnish evidence that supporting programmes are being implemented as described in the WSP. Review relevant records to confirm. Score 4 where records indicate that supporting programmes are being carried out as planned; score 2 where available records indicate the supporting programmes are | 0 | Operators are not trained. No awareness program carried out. |

| | | being carried out to some extent but where there are gaps in records or some departures from implementation plan in WSP; score 0 where no records exist to confirm implementation of supporting programmes. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations.) | | |
|---|--|--|--------------------|--|
| 9. REVIEW AND REVISION | | | | |
| Objective: ensure that the WSP remains up to date and effective through regular review and revision. | | | | |
| Question | | Tips for auditor and scoring guidance | Score (0–4) | Comment/justification |
| 9.1 | Is a schedule for regular review and revision of the WSP defined? | Regular review and revision of the WSP by the WSP team is essential to ensuring that the WSP remains relevant and guides day-to-day operations. WSP review following an emergency or incident is also important. Score 4 if the WSP includes a clearly defined schedule of regular WSP review and revision; score 0 where a regular review schedule is not defined in the WSP. (Scores 1, 2 and 3 can be assigned at auditor’s discretion for ‘in between’ situations.) | 4 | Schedule for regular review and revision are clearly defined. |
| 9.2 | Is the WSP being reviewed and revised as planned? | The WSP team should be able to furnish evidence that the WSP is being reviewed and revised as per the review schedule defined in the WSP, e.g. minutes from review meetings and or old/updated WSP versions. Score 4 only if the target frequency is documented in the WSP and there is evidence that it is being reviewed at this frequency; score 2 if there is partial evidence that WSP is being reviewed at least annually (or at the target frequency in the WSP); score 0 if there is no evidence of regular WSP review. (Scores 1 and 3 can be assigned at auditor’s discretion for ‘in between’ situations.) | 2 | There is partial evidence of revision of WSP (revised till 2021) |

| Audit area/WSP element | Current audit score | | Score from previous audit (n/a for initial audit) | Current qualitative assessment (excellent, good, below average, etc.) |
|---|---------------------|-----------------|---|---|
| | Points received | Points possible | | |
| 1. WSP TEAM | 9 | 16 | NA | Below average |
| 2. SYSTEM DESCRIPTION | 9 | 16 | NA | Below average |
| 3. HAZARD ID AND RISK ASSESSMENT | 16 | 20 | NA | Good |
| 4. IMPROVEMENT PLAN | 10 | 12 | NA | Good |
| 5. OPERATIONAL MONITORING | 4 | 8 | NA | Below average |
| 6. VERIFICATION | 8 | 20 | NA | Priority attention needed |
| 7. MANAGEMENT PROCEDURES | 6 | 12 | NA | Below average |
| 8. SUPPORTING PROGRAMMES | 1 | 8 | NA | Priority attention needed |
| 9. REVIEW AND REVISION | 6 | 8 | NA | Below average |
| GRAND TOTAL SCORE | 69 | 120 | NA | Attention needed |

Grand total score: 69 / 120

Circle grand total score below:

| | | | | | |
|-----------------------------|-----------------------------|-----------------------|-------------------------|----------------------------------|--|
| 115–120 Excellent | 103–114 Very good | 91–102 Good | 79–90 Average | 61–78 Attention needed | ≤ 60 Priority attention needed |
|-----------------------------|-----------------------------|-----------------------|-------------------------|----------------------------------|--|

END OF REPORT
