Borehole with a motorized pump

A. GENERAL INFORMATION

A.1. Borehole information

Borehole location (e.g. village, town, community, parish, district, province, state)						
Additional location information State the reference system and units, if using coordinates (e.g. national grid reference coordinates, GPS coordinates)						
Year of construction of borehole	**Borehole depth** (including units)	**Approximate number of households using this water source** Circle one of the options below				
		1–10	11–50	51–100	101–500	>500
Source of power for the motorized pump Tick (✓) the appropriate box(es) and provide further information where applicable		❑ Fuel ❑ Solar ❑ Electricity ❑ Wind ❑ Other. Describe:				
Circle one of the options below				If **Yes**, describe (e.g. type of back-up power supply, how reliable it is)		
Is there a back-up power supply for the motorized pump?	Unsure	No	Yes			
Circle the options below				If **Yes**, describe (e.g. what happens, how often, for how long)		
Is the borehole affected by flooding?	Unsure	No	Yes			
Is the borehole affected by drought?	Unsure	No	Yes			

A.2. System functionality

Circle **Yes** or **No** to indicate if water is currently available from the borehole. If **No**, describe why (e.g. faulty pump, no power supply, low water level) and then go to Section B. In Section C, record the corrective actions needed for the borehole to provide water, and record the details of any alternative water source(s) currently being used.

Is water currently available from the borehole?		If **No**, describe why (then go to Section B)
Yes	No	

A.3. Weather conditions during the 48 hours before inspection

Circle the temperature and precipitation options below to indicate the main conditions during the 48 hours before the inspection. More than one option may be circled if conditions changed during this time. Record additional information in Section C if needed.

Temperature	<0 °C	0–15 °C	16–30 °C	>30 °C
Precipitation	Snow	Heavy rain	Rain	Dry

A.4. Water quality sample information

Record details of any water quality samples taken during the inspection. Include information for any parameters tested. Add **NA** if information is not applicable. Record additional information in Section C if needed.

Sample taken? Circle **No** or **Yes**		**Sampling location**	**Sample identification code**	**Other information**
No (go to A.5)	Yes			

Parameter tested	*E. coli*[a]		***or*** Thermotolerant (faecal) coliforms[a]		Additional parameter		Additional parameter		Additional parameter	
	Results	Units	Results	Units	Results	Units	Results	Units	Results	Units
Results and units										

A.5. Water treatment

Tick (✓) the appropriate box(es) and provide additional information as needed.

❑ **No treatment applied.**

❑ **Treatment applied at the borehole.** Describe (e.g. chlorine dose, frequency of dosing, how it is applied).[b]

❑ **Treatment applied downstream of the borehole.** Describe (e.g. water treatment plant, household water treatment).

[a] The presence of *E. coli* (or thermotolerant [faecal] coliforms) suggests recent faecal contamination. If detected, further action is needed, such as increased disinfection at or downstream of the borehole, additional sampling and investigation of potential sources of contamination, and/or household water treatment advisories (e.g. boil water notice).
Note – thermotolerant (faecal) coliforms are distinct from "total coliforms", where total coliforms do not necessarily indicate recent faecal contamination.

[b] Where chlorine is applied, the free chlorine residual concentration in the drinking-water should be tested and the result recorded in Section A.4. Where possible, turbidity and pH should also be measured. For general information on chlorination, refer to Technical notes on drinking-water, sanitation and hygiene in emergencies: measuring chlorine levels in water supplies (WHO & WEDC, 2013).

General notes

- This form is intended for use on a single borehole with a motorized pump. Where there are multiple boreholes to be inspected, additional forms will be needed. Boreholes may be inspected on a rotational basis where there are too many to cover during each inspection.
- If other water sources are in use (e.g. spring, rainwater collection), the borehole feeds a piped distribution system (including filling station or kiosk), or if users collect and store water in the home, carry out additional sanitary inspections using the corresponding sanitary inspection packages.

B. SANITARY INSPECTION

IMPORTANT: Read the following notes before completing the sanitary inspection

1. Tick (✓) the appropriate box for each question. For guidance, refer to the numbered risk factors in Figure 1; the numbers in the figure are linked to the questions. Record any additional risk factors present in Section C. Refer also to the *Technical fact sheet* for information on the individual components of the borehole. *Note* – the questions in this section are example risk factors only, which can be used as a starting point for adapting the form to the local context.
2. Tick the **NA** (not applicable) box if the question ***does not apply*** to the borehole being inspected.
3. Tick the **No** box if the question does apply to the borehole being inspected, but the risk factor ***is not present***.

4. Tick the **Yes** box if the risk factor ***is present***. For important situations that require attention, record the corrective actions to be taken in the last column. These notes can be used to develop a detailed improvement plan, documenting what will be done, who will do it, by when it will be done and what resources are required. For guidance, refer to the *Management advice sheet*. Where possible, address the most serious risk factors first, considering low-cost or no-cost improvements that can be made immediately.

5. If a question cannot be answered because access to a component is not possible, tick the **Yes** box. Record these issues in Section C for further investigation.

Figure 1. Typical risk factors associated with a borehole with a motorized pump

	Sanitary inspection questions	NA	No	Yes	If Yes, what corrective action is needed?
1	**Is the borehole cap missing or in poor condition?** Contaminants could enter the borehole if there is no borehole cap in place, or if the cap is in poor condition (e.g. damaged, severely corroded, does not fit tightly). This could also happen if there are gaps in the borehole cap (e.g. unsealed holes that allow electrical cables to pass through).	❑	❑	❑	
2	**Is the area directly around the borehole seal dirty?**[c] Contaminants could enter the borehole if the area directly around the borehole seal is dirty or shows signs of pollution (e.g. animals, faeces).	❑	❑	❑	
3	**Is the pump in a location where fuel or oil could enter the borehole?** Chemical contaminants could enter the borehole from fuel or oil leaks if the pump is located above, or immediately beside, the borehole. This could also happen if there is accidental spillage during re-fuelling or maintenance.	❑	❑	❑	
4	**Does the floor around the borehole allow water to pass through it?** Contaminants could enter the borehole if the floor is permeable and allows water to pass through it (e.g. an earthen floor). This could also happen if the floor has deep cracks or gaps that allow water to pass through.	❑	❑	❑	
5	**Is drainage inadequate, which could allow water to accumulate in the borehole area?** Stagnant water could contaminate the borehole if there is no drainage system in place. This could also happen if the drainage system is damaged (e.g. deep cracks) or blocked (e.g. from leaves, sediment). *Note* – the presence of pooled water during the inspection may indicate poor drainage.	❑	❑	❑	
6	**Are the borehole and pump inadequately covered?** Contaminants may enter the borehole if the borehole and pump are not covered (e.g. housed outside in the open). This could also happen if they are housed in a structure that is in poor condition and open to the environment (e.g. a pump house with a damaged roof).	❑	❑	❑	

SANITARY INSPECTION FORM: Borehole with a motorized pump

Sanitary inspection questions		NA	No	Yes	If Yes, what corrective action is needed?
7	**Is the fence or barrier around the borehole and pump missing or inadequate?** Animals or unauthorized people could contaminate or damage the borehole area if the fence or barrier around the borehole area is missing. This could also happen if the fence or barrier is broken or poorly built (e.g. has large gaps), or the entry point (e.g. gate) does not close securely.	❑	❑	❑	
8	**Is there sanitation infrastructure within 100 metres of the borehole?**[d] Sanitation infrastructure (e.g. latrine pit, septic tank, soakage field, sewer pipes) close to the borehole may affect water quality. For example, waste could seep into the groundwater or overflow and be washed into the borehole, particularly after rain. Visually check structures in this area, and ask community members, to see if the structures are sanitation related.	❑	❑	❑	
9	**Can other sources of pollution be seen within 50 metres of the borehole (e.g. open defecation, animals, open drains, rubbish, commercial/industrial activity, fuel storage/disposal)?**[d] The presence of animals or faeces on the ground close to the borehole poses a serious risk to the safety of the drinking-water. Contaminants from other waste (e.g. household, agricultural, industrial) could be washed into the borehole during rain or may seep into the groundwater.	❑	❑	❑	
10	**Is there any unprotected entry point to the aquifer within 100 metres of the borehole?**[d] An unprotected entry point to the aquifer (e.g. uncapped borehole, open dug well) could allow contaminants to enter the groundwater and contaminate the borehole.	❑	❑	❑	
	Total number of Yes responses				

[c] A seal protects the borehole from surface water contamination, filling the underground area between the borehole casing and the surrounding earth. Refer to the *Technical fact sheet* for further information.

[d] General guidance only. Appropriate minimum safe distances depend on local factors including soil type and permeability, depth of the water table, and volume and concentration of contaminants. For guidance on determining minimum safe distances for polluting activities, refer to Guidelines for drinking-water quality: small water supplies (WHO, 2024).

C. ADDITIONAL DETAILS

Include any additional risk factors,[e] recommendations, observations or remarks from users of the water source (e.g. problems with the taste, odour or appearance of the water, water source reliability). Attach additional sheets and photographs if needed.

[e] These risk factors should be considered for future inclusion in Section B.

D. INSPECTION DETAILS

Name of inspector: _____

Organization: _____

Designation/title of inspector: _____

Signature: _____ Date: _____

Name of water supply representative: _____

Contact number (if available): _____

Signature (if available): _____ Date: _____

World Health Organization
Water, Sanitation, Hygiene and Health Unit
Avenue Appia 20, 1211 Geneva 27, Switzerland
Email: gdwq@who.int
Website: https://www.who.int/health-topics/water-sanitation-and-hygiene-wash

World Health Organization

Borehole with a motorized pump

This technical fact sheet provides background information on a borehole with a motorized pump, which supports the sanitary inspection of this drinking-water source.[a]

A borehole consists of a drilled hole in the ground with a secure water-lifting device (e.g. motorized pump, hand pump) that is used to bring groundwater to the surface.

Groundwater is considered to be better quality than surface water in many places. Boreholes that access deeper groundwater are generally better quality than boreholes that access shallower groundwater. However, appropriate treatment/disinfection are required for groundwater sources that are vulnerable to contamination.

Boreholes can be constructed using machinery-powered techniques (e.g. percussion drilling).[a] The borehole should be lined with a casing and screen and fitted with a secure water-lifting device, such as a motorized pump in the case of deeper boreholes.[b]

Boreholes are generally 0.1–0.25 metres in diameter. For this reason, boreholes cannot be physically accessed by a person for maintenance or cleaning (e.g. sediment removal and disinfection). These activities must be carried out from ground level once the borehole cap has been removed.

Boreholes should have adequate capacity (i.e. have an appropriate depth below the water table) to meet the needs of users at all times of the year. Limited capacity could result in users seeking alternative drinking-water sources that could be less safe. If water is collected directly from the borehole facility by users (e.g. at a public borehole tap), the water collection area should be built so it is accessible for all users.[c]

Figure 1 shows a common type of borehole with a motorized pump. Treatment/disinfection of the water may take place on-site at the borehole facility, or off-site (e.g. at a downstream water treatment plant, as per the example shown in Figure 1). A section view of the belowground elements of the borehole is shown in Figure 2. These figures show a typical design. Other designs can also provide safe drinking-water.

Typical risk factors associated with a borehole with a motorized pump are presented in the corresponding *Sanitary inspection form.*

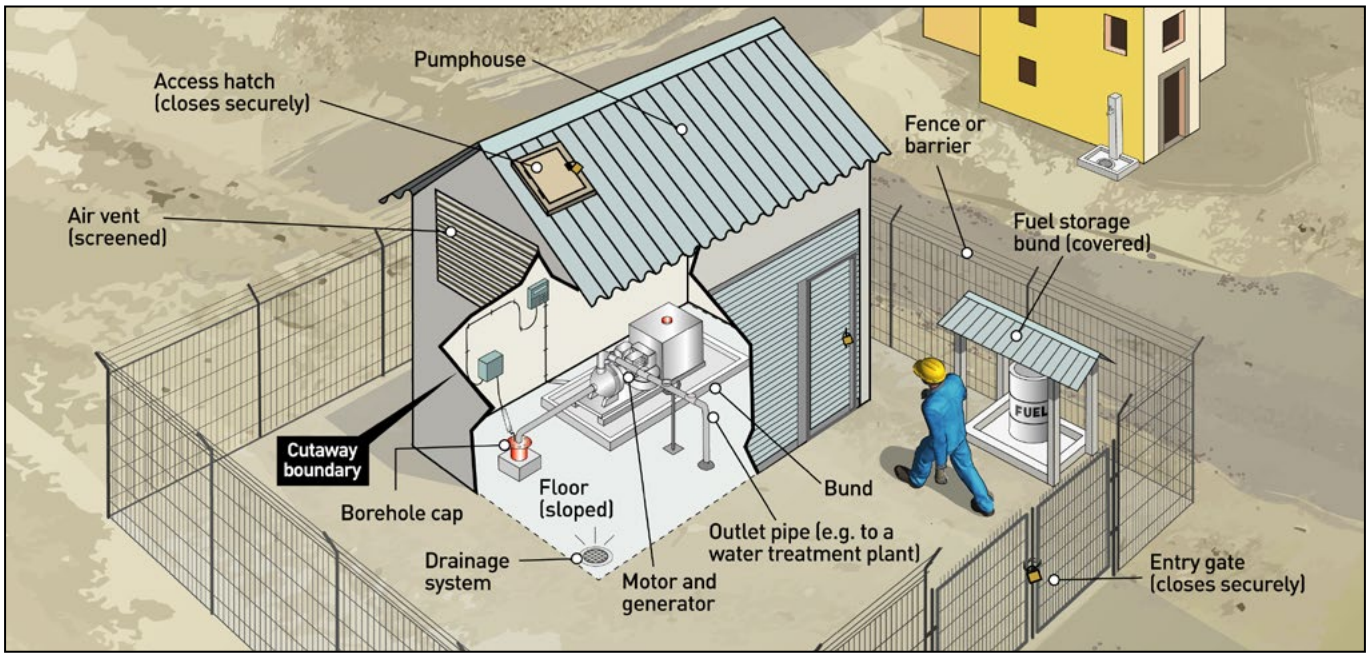

Figure 1. A common borehole with a motorized pump in a sanitary condition

[a] This fact sheet is not intended to serve as a guide to construction. For detailed guidance on the design and construction of a borehole, refer to Technical review: borehole drilling and rehabilitation under field conditions (ICRC, 2012).

[b] Hand pumps (levered type) may be suitable for water abstraction depths of up to approximately 45 metres. Deeper than 45 metres, geared hand pumps or motorized pumps are typically required.

[c] For guidance on designing accessible facilities, refer to Water and sanitation for disabled people and other vulnerable groups: designing services to improve accessibility (Jones & Reed, 2005).

A borehole with a motorized pump typically includes the following main components.

Borehole

- **Borehole cap:** Covers the top of the borehole to prevent contaminants entering the borehole. The cap should be fitted tightly. Any gaps in the borehole cap (e.g. to allow pipework or electrical cables to enter the borehole) should be sealed to prevent the entry of contaminants (using a sealant that is safe for contact with drinking-water).
- **Seal:** Provides structural protection for the upper part of the borehole, and protects the borehole from surface water contamination. The seal is typically constructed using a mixture of cement, bentonite (clay) and sand. The seal should fill the gap between the casing and surrounding ground, and should not allow water to pass through it. For adequate protection, the seal should extend to a depth of at least 3 metres.
- **Casing:** Provides structural support for the walls of the borehole and protects the pipe that delivers water to the surface (i.e. the **rising main**) and pumping mechanism. The casing should have sufficient strength to resist collapse, and is typically made from water-resistant materials such as metals, plastic or fiberglass. To protect from surface water contamination, the casing should ideally extend to at least 0.5 metres above the ground.
- **Screen:** Provides structural support for the borehole and allows water to enter the casing (acting also as a barrier to prevent larger particles from entering the rising main). The screen material should be resistant to corrosion and have sufficient strength to resist collapse.

Motorized pump

- **Motor and generator:** Provides power to the pump for water lift. In this example, a diesel-powered motor is shown. However, other fuel- (e.g. petrol), electricity- and solar-powered motors are also common.[d] The pump should be installed in a place where fuel or oil cannot directly contaminate the borehole (e.g. from leakages or spillages; see bund below).
- **Bund:** Captures and contains any fuel or oil leaks and spillages. Fuel storage bunds that are housed outside should be covered to prevent rain accumulating in the bund – which could reduce the volume of fuel that the bund can capture in the event of a leak from the fuel container.
- **Pump:** Draws groundwater from the borehole and delivers it through the rising main to the surface. The pump should be appropriately sealed to prevent any leakage of oil or lubricant into the borehole.
- **Floor:** Protects the borehole from contaminants (e.g. contaminated surface water). The floor should not allow water to pass through it, and is typically constructed from brick or concrete. The floor should slope down from the borehole to a defined drainage system.
- **Pump house:** A covered structure to protect the borehole and pump from the external environment. The pump house should prevent the entry of vermin (e.g. sealed roof and walls, vermin-proof screens on air vents and drains). Adequate air/exhaust vents are required for fuel-powered motors to stop the motor from overheating and to prevent the build-up of exhaust fumes during operation. A removable roof or **access hatch** may be required to facilitate borehole maintenance (e.g. replacement of casing).

  In some settings, the borehole may be housed externally (i.e. separate to the pump) in a closed sealed chamber.[d]
- **Drainage system:** Directs water away from the borehole and pump house area to a drainage system. The drainage system should slope down from the facility to stop water ponding and stagnating, which could contaminate the borehole.
- **Fence or barrier:** A physical barrier to stop animals from contaminating the borehole area or damaging the components. It may also prevent unauthorized access by people. The fence or barrier should have an entry point (e.g. a gate) that can be closed tightly and latched shut/locked. Where practical, the fence or barrier should ideally be constructed at least 15 metres from the borehole (general guidance only).[e]

Additional considerations

Before the borehole is constructed, sources of naturally occurring contaminants (e.g. arsenic, fluoride) and contamination from human activities (e.g. agriculture, industry) should be investigated to determine their impact on groundwater quality. Latrines and other sanitation facilities should be identified before choosing a site for the borehole.

The borehole design should be appropriate for the local geological conditions (e.g. the casing should be deep enough to prevent contamination from shallower aquifers).

[d] For guidance on different borehole and pump types, refer to *Compendium of drinking water systems and technologies from source to consumer* (WHO, in preparation).

[e] For guidance on determining appropriate minimum safe distances for polluting activities, refer to Guidelines for drinking-water quality: small water supplies (WHO, 2024).

The corrosion potential of the groundwater should be considered when selecting components for the borehole. If the groundwater has low pH, high salinity and high chloride, corrosion-resistant materials are required.

When constructing new boreholes or rehabilitating old ones, all materials used should be safe for contact with drinking-water (e.g. using materials approved through an appropriate certification scheme).

After a new borehole is constructed, it should be cleaned, flushed and disinfected (e.g. with chlorine), and flushed again, to disinfect the components before the water is used.[f] Ideally, water quality testing should be conducted before the borehole is commissioned to confirm the water is safe for consumption. Periodic disinfection and testing may also be required (e.g. after flooding, after maintenance).

A second "stand-by" pump should ideally be in place to maintain continuous water supply during planned maintenance, or if the primary "duty" pump fails. For electrical pumps, a back-up power supply (e.g. generator) should be available if there are frequent power outages, to ensure the continuity of supply.

To ensure operator safety, any electrical or mechanical installation work should be carried out by a qualified person according to the relevant safety standards.

If the borehole supplies a piped distribution network, the pump should be fitted with a one-way valve on the discharge side of the pump to prevent the backflow of contaminated water into the borehole.

For shallower boreholes with hand pumps, refer to the *Sanitary inspection package: tubewell with a hand pump*, which may be adapted for boreholes.

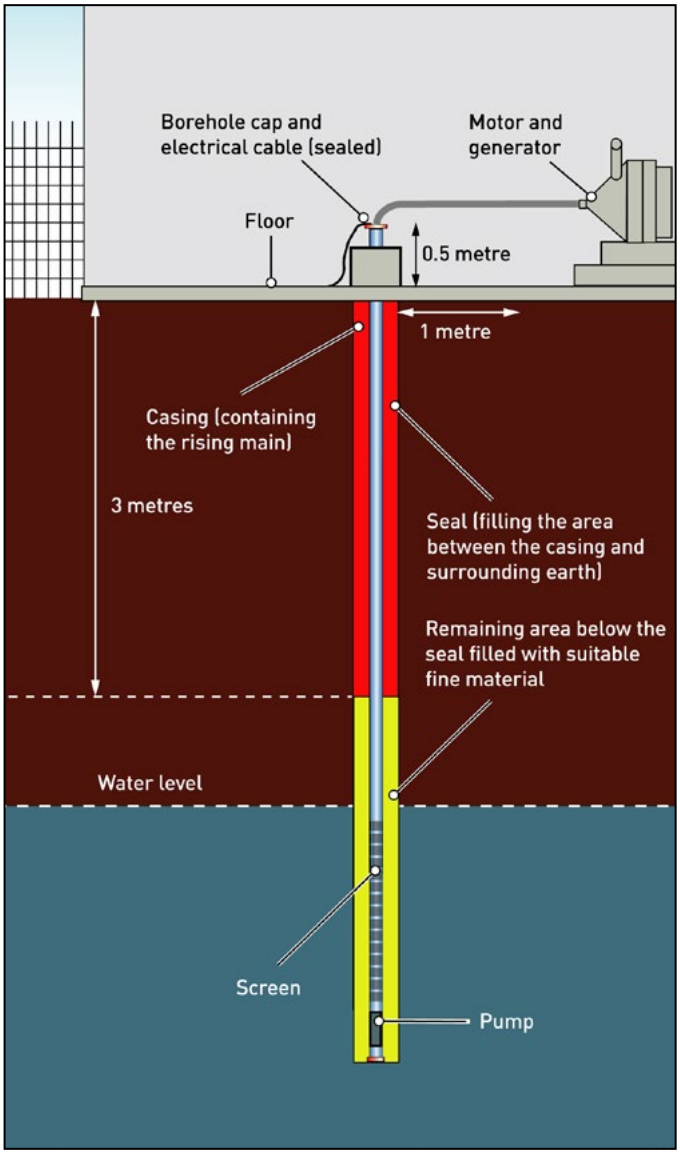

Figure 2. A borehole with a motorized pump in a sanitary condition (section view)

[f] See Technical notes on drinking-water, sanitation and hygiene in emergencies: cleaning and rehabilitating boreholes (WHO & WEDC, 2013).

World Health Organization
Water, Sanitation, Hygiene and Health Unit
Avenue Appia 20, 1211 Geneva 27, Switzerland
Email: gdwq@who.int
Website: https://www.who.int/health-topics/water-sanitation-and-hygiene-wash

World Health Organization

Borehole with a motorized pump

This management advice sheet provides guidance for the safe management of a borehole with a motorized pump, which supports the sanitary inspection of this drinking-water source.

Guidance for typical operations and maintenance (O&M) activities is provided in Table 1, including suggested frequencies for each activity. These activities are important for keeping the borehole and motorized pump in good working condition and protecting drinking-water quality.

Table 2 lists potential problems that may be identified during a sanitary inspection, and provides basic corrective actions to consider for each problem.

This management advice sheet can also support routine management and monitoring practices, which are required to help ensure the ongoing safety of the water supply.

A. OPERATIONS AND MAINTENANCE

Basic O&M can usually be carried out by a trained owner, user or caretaker/operator (e.g. simple maintenance tasks such as cleaning the borehole area, checking fuel/oil levels of the pump). Larger repairs and maintenance tasks (e.g. repairing the screen, pump maintenance) may need skilled labour which can be provided by local craftspeople, or with support from outside of the local area.

The condition of the borehole and motorized pump should be inspected routinely to help prevent contaminants entering the water supply. Any damage or faults should be repaired immediately (e.g. deep cracks in the floor, broken fence, intermittent pump mechanical fault). Standard operating procedures (SOPs) should be developed for important O&M tasks (e.g. removing the borehole cap for maintenance, replacing the screen). These should be followed by trained individuals so the work is carried out safely and the borehole is not contaminated during the work. All electrical and mechanical maintenance and repairs should be conducted by a qualified person in accordance with the relevant safety standards.

Consultation with the relevant authorities may be required to ensure that sanitation infrastructure (e.g. latrine pits, septic tanks, sewers, soakage fields) is not built near the borehole unless hydrogeological studies show that it is safe to do so. Consideration should also be given to catchment activities that extract groundwater (e.g. for irrigation, mining, power) to ensure an adequate quantity of drinking-water to meet the needs of users.

If a public tap is provided immediately at the borehole area, activities other than the collection of drinking-water (e.g. laundry, washing, bathing) should not be permitted in the area. These should be carried out at a safe distance downhill from the borehole.

Adequate treatment/disinfection are required before consuming the drinking-water if the borehole is vulnerable to contamination, or if the water could be contaminated due to unhygienic storage and handling by the user during transport or in the home.

Table 1. Guidance for developing an operations and maintenance schedule

Frequency	Activity
Daily to weekly	• Check and clean the borehole facility, including the area around the seal. Remove any polluting materials (e.g. faeces, rubbish). • Check that the fuel and oil levels of the pump are adequate. Re-fill as needed. • Check that the pump is working.[a] Perform pump maintenance as needed, repair or replace damaged parts, then clean and disinfect the pump (e.g. with chlorine). • Check that the drainage channel is clear and in good condition. Remove debris or repair as needed. • Check that the fence or barrier is in good condition and that the entry point (e.g. gate) can be closed securely and latched shut/locked. Repair as needed. • Record relevant information in operational logs (e.g. meter readings, instrumentation readings, valve checks, static water level, fuel levels etc.).

Table 1. ...continued

Frequency	Activity
Annually	• Perform detailed inspection of the borehole structure (including the screen) for signs of damage or failure. Repair or replace damaged parts as needed.[b]
As the need arises[c]	• Remove sediment, and clean (e.g. via high pressure water jetting) and disinfect the borehole e.g. with chlorine).[d] • Unclog the screen. • Rehabilitate the borehole (e.g. deepen the borehole, replace casing/screen, repair the seal).[b] Replace any eroded earth around the borehole, and fill any depressions in the ground where water ponds. • Monitor water yield and use to identify changes (e.g. during periods of drought). • Ensure procurement of any materials in contact with drinking-water and water treatment chemicals (where used) are safe for drinking-water use.

[a] For guidance on functionality checks and preventative maintenance for the motorized pump, refer to manufacturers' guidance or local tradespeople as required. *Note* – where there is a secondary stand-by (or "back-up") pump or generator, these should also be routinely checked and maintained.

[b] For guidance on construction and rehabilitation aspects, refer to Technical review: borehole drilling and rehabilitation under field conditions (ICRC, 2012).

[c] See Table 2 for potential problems that could trigger these activities.

[d] See Technical notes on drinking-water, sanitation and hygiene in emergencies: cleaning and rehabilitating boreholes (WHO & WEDC, 2013). Disinfection is required following a contamination event (e.g. after flooding, *E. coli* detection).

General notes

- The suggested frequencies in Table 1 are a minimum recommendation. The frequency of activities may need to be increased depending on the local context. A suitable O&M schedule should be made for each site, including who is responsible for performing the work. Completion of activities as per the O&M schedule should be recorded, including additional details for any problems identified and corrective actions undertaken.
- Only people with relevant training and skills should undertake the activities in Table 1. Appropriate safety measures should be taken when working with electricity. Care should be taken when handling disinfection products.
- For guidance on appropriate frequencies for monitoring (e.g. sanitary inspections, water quality testing), refer to Guidelines for drinking-water quality: small water supplies (WHO, 2024).

B. PROBLEMS AND CORRECTIVE ACTIONS

Each problem in Table 2 is linked to the same question number in Section B of the *Sanitary inspection form.* Where relevant, corrective actions should be completed by trained individuals according to SOPs. Where needed, develop awareness raising and education programmes, and if necessary, local rules or regulations, to support safe drinking-water management in the context of the guidance provided in Table 2.

If problems are identified that represent an immediate threat to drinking-water safety (e.g. likely presence of faecal contamination in the water supply, positive *E. coli* detection), consider what immediate actions should be taken to minimize the risk to public health (e.g. advise users to seek an alternative safe drinking-water source, disinfect the water at the point of use).

Table 2. Common problems associated with a borehole with a motorized pump, and suggested corrective actions

Question	Problem identified	Corrective actions to consider
1	The borehole cap is missing, is in poor condition (e.g. damaged, severely corroded, does not fit tightly) or has unsealed gaps, which could allow contaminants to enter the borehole.	• If a borehole cap is missing or in poor condition, provide a temporary seal (e.g. impermeable plastic sheeting) over the casing to minimize the entry of contaminants into the borehole. Install or repair the borehole cap as soon as possible. • Ensure that all gaps in the borehole cap (e.g. for electrical cables) are sealed with a sealant that is safe for contact with drinking-water.
2	The area directly around the borehole seal is dirty (e.g. animals, faeces), which could allow contaminants to enter the borehole.	• Clean the area around the borehole seal. • Communicate the importance of maintaining the area around the seal in a clean condition.
3	The pumping mechanism is in a location where fuel or oil could directly enter the borehole (e.g. located directly above the borehole).	• Ensure any potential source of fuel or oil is stored in an appropriately-sized fuel bund to contain any spills/leaks. • If the bund is located outside, ensure the bund is adequately covered to prevent rain accumulating within it, which could reduce the bund capacity to capture fuel in the case of a leakage. • If required, seek support from relevant tradespeople to reconfigure the system to minimize the risk of fuel or oil entering the borehole (e.g. relocating the pumping mechanism from above the borehole to an adjacent position).
4	The floor around the borehole and pumping mechanism allows water to pass through it, which could allow contaminants to enter the borehole (e.g. from contaminated surface water).	• If the floor allows water to pass through it, construct an impermeable (e.g. concrete) floor around the borehole and pumping mechanism, ensuring it slopes down from the borehole, towards a drainage system. • If the floor is damaged (e.g. has deep cracks), repair the floor to ensure it is adequately sealed.
5	The drainage is inadequate (e.g. absent, damaged or blocked drain), which could result in stagnant water contaminating the borehole.	• If a drainage system is absent, provide a temporary drainage channel to divert water away from the borehole area. Construct a permanent solution as soon as possible. • If the drainage system is not working, consider whether maintenance is needed (e.g. repair, cleaning), or if deepening, widening or extending is required.
6	The borehole and pumping mechanism are inadequately covered (e.g. out in the open, in a pump house or chamber that is in poor condition and exposed to the environment), which could allow contaminants to enter the borehole.	• If the borehole and pumping mechanism are housed out in the open, provide a suitable temporary cover where practical. Construct a permanent lockable structure as soon as possible (e.g. chamber, pump house). • If the pump house or chamber structure is damaged or in poor condition, repair it as soon as possible.
7	The fence or barrier around the borehole and pump house is missing, or inadequate to prevent animals or unauthorized people from contaminating the area or damaging borehole components.	• If absent, construct a robust fence or barrier with a lockable gate that closes securely. • If a fence or barrier is present but inadequate to prevent access, repair or replace it. • If the entry point (e.g. gate) to the borehole area is damaged and/or does not close securely, repair or replace it.

Table 2. ...continued

Question	Problem identified	Corrective actions to consider
8	There is sanitation infrastructure (e.g. latrine pit, septic tank, soakage field, sewer line) within 100 metres of the borehole and pumping mechanisms that could contaminate the borehole (e.g. from overflow, seepage).[e]	• Involve local authorities to assess the significance of the risk from the sanitation infrastructure. • Consider what immediate actions should be taken to minimize the risk to public health (e.g. advise the household to treat the water before consumption). • Consult with local authorities to consider appropriate steps to relocate or eliminate the source of pollution.

9	There are other sources of pollution (e.g. open defecation, animals, open drains, rubbish, commercial activity, fuel storage/disposal) within 50 metres of the borehole and pumping mechanism that could contaminate the borehole.[e]	• Where practical, remove the pollution (e.g. remove animal faeces, rubbish). Communicate the importance of maintaining the borehole area in a clean condition.
		• Consult with local authorities and users to consider:
		  ○ appropriate actions to relocate or eliminate the source of pollution
		  ○ other actions to minimize the issue from occurring again (e.g. signage, enforcement measures).

10	There is an unprotected point of entry to the aquifer (e.g. open or uncapped well or borehole) within 100 metres of the borehole and pumping mechanism that could provide a direct pathway for contaminants to enter the groundwater and contaminate the borehole.[e]	• Consult with local authorities to:
		  ○ assess the significance of the risk from the unprotected point of entry to the aquifer
		  ○ cover the point of entry in the immediate term
		  ○ consider what actions are appropriate to permanently seal, decommission or relocate the point of entry.

[e] General guidance only. Appropriate minimum safe distances depend on local factors including soil type and permeability, depth of the water table, and the volume and concentration of contaminants. For guidance on determining minimum safe distances for polluting activities, refer to Guidelines for drinking-water quality: small water supplies (WHO, 2024).

World Health Organization
Water, Sanitation, Hygiene and Health Unit
Avenue Appia 20, 1211 Geneva 27, Switzerland
Email: gdwq@who.int
Website: https://www.who.int/health-topics/water-sanitation-and-hygiene-wash