HEALTH HOLDING

HAFER ALBATIN HEALTH CLUSTER
MATERNITY AND CHILDREN HOSPITAL

Department:	Infection Prevention and Control Department		
Document:	Departmental Policy and Procedure (DPP)		
Title:	Water Quality Monitoring Program and Requirements		
Applies To:	Public Health		
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1. PURPOSE:

1.1 To monitor the quality of water by defining the essential standards for water consumption in healthcare facilities based on the requirements of the Ministry of Health.

2. DEFINITONS:

2.1 Water quality monitoring is defined as the sampling and analysis of water constituents and conditions. These may include: Introduced pollutants, such as pesticides, metals, and oil.

3. POLICY:

3.1 Potable drinking water compliant with quality standards must be maintained at healthcare facilities to protect patients, staff, visitors, and the whole community. These standards must be strictly enforced to limit contamination and avoid health hazards.

3.2 A regular microbiological sampling and testing from all water supply areas must be conducted by the Infection Prevention and Control (IP&C) Department

3.3 Immediate corrective action shall be taken as recommended by the IP&C for any potential water contamination or infection risk in coordination with concerned departments such as Facility Management & Safety (Utilities & Maintenance U&M section) and Primary Health-care Clinics (PHC).

3.4 Laboratory facilities shall perform the required analysis for any urgent or corrective measure of routine water analysis to maintain acceptable water quality.

3.5 Records of laboratory results related to water quality monitoring shall be maintained by IP&C, Facility Management & Safety (U&M section), and other concerned departments.

3.6 An effective preventive program which includes treatment such as chlorination and chlorine monitoring, cleaning water supply system, and sampling schedule will be designed and implemented.

3.7 All efforts shall be made to prevent risk of contamination of water supply system due to chemicals used, renovation and construction, fire, or other related industrial, agricultural, and human activities

4. PROCEDURE:

4.1 Each program facility must implement a routine maintenance program to maintain an acceptable clean water distribution system.

4.2 Facility Management & Safety will properly manage the chemical water treatment to ensure safe drinking water

4.3 A safe water supply system will be equipped with back flow preventers to prevent back-si- phonage, backpressure, and cross contamination. Only air gaps are recommended for preventing sewage back-siphonage contamination. To protect against backflow contamination of potable water supply by cross connections, either two check valves in series or a backflow preventer must be used (i.e., a pumping device to prevent backflow)

4.4 U&M must ensure sufficient water available in the hospital, satellite facilities, and residential compounds at all times. For other residential compounds, water availability and safety is maintained

by conducting regular water sampling. Access will be guaranteed to IP&C and other relevant departments to perform inspection, testing, and safety of the compound's water.

4.5 Chlorination systems will be checked daily by U&M to ensure the chlorination compound supply has not run out and applicable limits are respected.

4.6 The Water Distribution Management Plan

4.6.1 Preventive measures. A preventive maintenance program will include monitoring, inspection, cleaning, disinfection of the water supply system, sampling schedules, and frequency of the following listed below:

4.6.1.1 Potable water system;

4.6.1.2 Hemodialysis and emergency water system;

4.6.1.3 Domestic hot water system;

4.6.1.4 Showers, faucets, humidifiers, fountains and drain pans; and

4.6.1.5 Recreation and irrigation water.

4.6.2 Testing equipment and water sampling

4.6.2.1 A detailed physico-chemical potable water quality testing and sampling will be performed annually by an independent certified water-testing laboratory. A copy of the results must be forwarded to IP&C.

4.6.2.2 The preventive maintenance program will include periodic inspection and investigation to ensure that all water equipment is in good operational condition at all program facilities.

4.6.2.3 Water quality testing for hemodialysis water shall be performed for chemical and microbiological parameters. See appendices 7.1 AAMI and EPA Maximum Allowable Levels of Contaminants in Water) at least on a monthly basis. A copy of the results must be forwarded to IP&C.

4.6.3 Record keeping :Records of water quality sampling results, laboratory reports, and chemicals used for treatment must be available at all times and be retained for a period of five years.

4.6.4 Physical Parameters

4.6.4.1 The water shall be aesthetically acceptable to consumers. Unusual taste and color might be an indication of potential contamination. However, the maximum allowable levels of contaminants in water are as follows:

4.6.4.1.1 Color <15 TCU (True Color Unit)

4.2.6.4.2 TDS < 600 mg/L (Total Dissolved Solids)

4.6.4.1.3 Turbidity < 5 NTU (Nephelometric Turbidity Units)

4.6.4.1.4 Ph:6.5-8.5

4.6.4.1.5 Conductivity for Hemodialysis water: 160-1600 Us/cm

4.6.4.1.6 Total hardness: Mg/l as CaCo, Max 200

4.7 Water Sampling: Water sampling must be conducted in accordance with the following steps:

4.7.1 Flush the tap for at least one minute. If the tap is a mixing faucet, attachments (i.e., screen and
aerators) must be removed. Hot and then cold water must be allowed to run through the tap for at least 1-10 minutes based on the location and frequency of use.

4.7.2 Turn off the tap and disinfect the end of the tap by 70% isopropyl alcohol or by using 500-600 ppm chlorine sodium hypochlorite (1:100 v/v dilution of chlorine bleach).

4.7.3 Turn on the tap and let it run for a few seconds before taking the sample.

4.7.4 Samples shall be collected in a sterile bag of minimum 100 ml capacity

4.7.5 A reducing agent called Sodium Thiosulphate [$Na_2S_2O_3$] shall be added to neutralize residual chlorine and other halogens in the sample.

4.7.6 If the water contains elevated levels of heavy metals, then a chelating agent shall be added to the specimen.

4.7.7 Sample site, date, and time shall be written on the label of each sample

4.7.8 Water samples must be kept in cold (approximately 4oC) containers and sent immediately to the designated laboratory preferably within 24 hours.

4.7.9 Usage of sterile reduced nutrient media (e.g., diluted peptone and R2 A) is preferable with either of the techniques such as heterotrophic plate count, pour plate, spread plate or member filtration.

4.7.10 Incubation temperatures will be closer to the temperature of the water rather than at 35°C within 24 hours for total coliform; and 44.5°C for fecal coliform within 48 hours.

4.8 Emergency Water Use and Other Water System

4.8.1 Safety shower and eye wash stations shall be flushed weekly by the department or as per agreement with Fire Protection Services.

4.8.2 The hot water temperature shall be maintained in accordance with the American Institute of Architect's (AIA) guidelines. Water temperature shall be maintained in patient care areas within the range of 105 - 120°F (40 - 49°C).

4.8.3 When shock decontamination of hot water system is necessary (e.g., after disruption caused by construction and after cross-connection), the hot water temperature should be raised to 160-170°F (71-77°C) and maintained at the level in which each outlet around the system is progressively flushed for a minimum of 5 minutes. U&M shall inform IP&C, the Safety Officer and other possible affected departments prior to shocking treatment in order to avoid scalding. Further, U&M will inform IP&C of any water outage planned or unplanned, or during any water distribution system damage, which may contaminate water supplies.

4.9 Corrective and Remedial Action

4.9.1 Any complaint of contamination shall necessitate complete investigation and immediate appropriate corrective action by the IP&C, U&M, and concerned departments.

4.9.2 A corrective action plan in response to various disease outbreaks or water contamination incidents should be in place.

4.9.3 Each unscheduled maintenance event shall be reviewed carefully before proceeding without compromising the facility water supply.

4.9.4 On completion of corrective actions, water resampling tests will be performed to ensure successful elimination of contamination. The reporting department will be notified to confirm water source is released for use as per the water resample results and release form.

4.9.5 The following steps shall be taken into consideration to minimize potential exposure risk:

4.9.5.1 Management of working hours by scheduling preventive maintenance during periods of low occupancy.

4.9.5.2 Isolate work area using temporary barriers.

4.9.5.3 A negative air pressure environment must be maintained in the worksite and in relation to the spaces adjacent to the worksite in order to prevent transmittal of airborne pollutants

4.9.5.4 Implement the use of specialized cleaning products, disinfectants, and procedures.

4.9.5.5 Change air filters if necessary when work is completed.

4.10 Chemical Use

U&M will make sure that only IP&C approved chemicals are used in water treatment programs. Updated Safety Data Sheets (SDS) and chemical inventories for chemicals added to water will be maintained.

5. MATERIALS AND EQUIPMENT:

5.1 **Forms and Records:**

5.1.1 Water Contamination Reporting Form

5.1.2 Water Resample Results and Release Form

5.2 **Materials and Equipment**

5.2.1 N/A

6. RESPONSIBILITIES:

6.1 Public Health and IPCD

7. APPENDICES:

7.1 AAMI and EPA Maximum Allowable Levels of Contaminants in Water

8. REFERENCES:

8.1 GCC Infection Prevention and Control Manual, 3rd 2018.

9. APPROVALS:

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Reviewed by	Dr. Kawther M. Abdou	Clinical Pathology Consultant		December 17, 2024
Reviewed by:	Ms. Awatif Hamoud Al Harbi	IPC Director		December 18, 2024
Reviewed by:	Mr. Sabah Turayhib Al Harbi	Nursing Director		December 19, 2024
Reviewed by:	Mr. Abdulellah Ayed Al Mutairi	QM & PS Director		December 22, 2024
Reviewed by:	Dr. Thamer Naguib	Medical Director		December 26, 2024
Approved by:	Mr. Fahad Hazam Al Shammari	Hospital Director & IPC Committee Chairman		December 29, 2024

Attachment:

5.1.1 Water Contamination Reporting Form

Water Contamination Reporting Form

Reference #: _____ **Date:** _____

To : _____
Director of Utilities and Maintenance

Water Contamination Description:

Location	Microbial Growth cfu/ml	Chlorine Level	Chloramine Level	Endotoxin	Physical Parameter: Color or elements traces

Recommendation / Corrective Action:

_____

_____

Inspected and Sample Taken by:

_____
Name & Signature from IP & C Department

Reviewed and Approved by:

5.1.2 Water Resample Results and Release Form

Water Resample Results and Release Form

To: _____ **Date:** _____
Requesting Department

Water Resample Results:

Location	Microbial Growth cfu/ml	Chlorine Level	Chloramine Level	Endotoxin	Physical Parameter: Color or elements traces

Remark:

_____

_____

_____

Inspected and Sample Taken by:

_____
Name & Signature from IP & C Department

Reviewed and Approved by:

_____
(Director's Name & Signature IP&C Department)

7.1 AAMI and EPA Maximum Allowable Levels of Contaminants in Water

AAMI and EPA Maximum Allowable Levels of Contaminants in Water

MNGHA Microbiological Standards for Drinking and Hemodialysis Water		
Contaminant	**Drinking Water**	**Hemodialysis Water**
E. Coli	0	0
Coliform	0	0
Enterococci	0	0
Legionellae	0	0
Virus	0	0
Other Bacteria:		
HPC	≤500 cfu/ml	≤100 cfu/ml
Action Level	≥200 cfu/ml	≥50 cfu/ml
Endotoxin:		
Acceptable Maximum Level (EU/ML)	N/A	0.25
Action Level (EU/ML)	N/A	0.125
** Action level at 90th percentile		HPC – Heterotrophic Plate Count CFU – Colony Forming Units
Source: 1. Association for the Advancement of Medical Instrumentation (AAMI). (2015). Water Quality for Dialysis. 2. World Health Organization, Geneva (2014). Guidelines for Drinking Water Quality – Recommendations, (4th ed., vol. 1).		