 <p>B.S. Aquino Drive, Bacolod City, Negros Occidental, 6100</p> <p>DR. PABLO O. TORRE MEMORIAL HOSPITAL</p>	Document Code:	DPOTMH-E-52-P10
	Effective Date:	09-30-2022
	Document Type:	Policy
	Page Number:	1 of 6
	Department/Section:	Laboratory Department
	Document Title:	<b>MICROBIOLOGICAL WATER ANALYSIS/TESTING POLICY</b>

### **PURPOSE:**

1. To comply with relevant water quality standards set by the Department of Health (DOH).
2. To appropriately check and identify the presence of microorganisms and to treat them before they do irreversible damage.
3. To look for indicator organisms as a sign of fecal contamination rather than specific pathogens.
4. To steer clear of any risk and ensure prevention of disease as per the Department of Health (DOH) standards.

### **LEVEL:**


Pathologists, Medical Technologists, Nurses, Physicians, Patients, Engineering Department (Safety Officer), IPCU Nurse

### **DEFINITION OF TERMS:**

1. **Microbiological Water Analysis:** It is a method of analyzing water to estimate the number of bacteria present (colony forming units) and to allow for the recovery of microorganisms in order to identify them.
2. **Contamination:** A general term referring to the introduction of materials not normally found in water that make the water less desirable or unfit for its intended use.
3. **Coliforms:** It refers to any rod-shaped, non-spore-forming, gram negative bacteria capable of growth in the presence of bile salts, or other surface-active agents with similar growth-inhibiting properties which are cytochrome-oxidase negative and able to ferment lactose at either 35 to 37 C with the production of acid, gas and aldehyde within 24-48 hours.
4. **Colony-Forming Units (CFU):** It is a unit used in microbiology to estimate the number of viable bacteria or fungal cells in a sample.

**Formula used for:  $CFU/ml = CFU \times \text{dilution factor} \times P1/\text{aliquot}$**



 <p>B.S. Aquino Drive, Bacolod City, Negros Occidental, 6100</p> <p>DR. PABLO O. TORRE MEMORIAL HOSPITAL</p>	Document Code:	DPOTMH-E-52-P10
	Effective Date:	09-30-2022
	Document Type:	Policy
	Page Number:	2 of 6
	Department/Section:	Laboratory Department
	Document Title:	<b>MICROBIOLOGICAL WATER ANALYSIS/TESTING POLICY</b>


5. **Heterotrophic Plate Count (HPC):** It is the total number of colonies or average number of colonies per plate that is the reciprocal of the dilution used.
6. **Most Probable Number(MPN):** It refers to the number of positive findings of coliform group organisms resulting from multiple-portion decimal dilution plantings.
7. **Pour Plate Method:** It is a plate method involves mixing the inoculum with the cooled but still fluid medium before pouring the mixture into the petri dish. It is the method of choice for counting the number of colony-forming bacteria present in a liquid specimen. Wherein a fixed amount of inoculum (generally 0.5 to 1.0 ml) from the sample or broth is placed in the center of a sterile Petri dish using a sterile pipette. Molten cooled agar (approximately 15 ml) is then poured into the Petri dish containing the inoculum and mixed well. After solidification of the agar, the plate is inverted and incubated at 37C for 24-48 hours.
8. **Re-growth:** It refers to the bacterial growth after water treatment.
9. **Spread Plate Method:** It is a viable counting technique to plate a liquid sample for the purpose of isolating or counting the bacteria present in that sample.

## **POLICY:**

### **General:**

1. Concerned areas will have to schedule their water collection and analysis a week prior to the actual collection.
2. The Laboratory Manager shall schedule one medical technologist for water analysis collection only.
3. The Laboratory staff assigned to collect samples shall be trained in sampling procedures and shall prepare all needed supplies for the water analysis collection.




 <p>B.S. Aquino Drive, Bacolod City, Negros Occidental, 6100</p> <p>DR. PABLO O. TORRE MEMORIAL HOSPITAL</p>	Document Code:	DPOTMH-E-52-P10
	Effective Date:	09-30-2022
	Document Type:	Policy
	Page Number:	3 of 6
	Department/Section:	Laboratory Department
	Document Title:	<b>MICROBIOLOGICAL WATER ANALYSIS/TESTING POLICY</b>

4. The Medical Technologist shall wear their complete personal protective equipment prior to collection.
5. The sample volume required shall not be less than 100 ml.
6. The microbiological analysis of water samples collected shall be initiated promptly after collection to avoid unpredictable changes.
7. When samples arrive at the laboratory, a sample identification number or accession number is marked on the sample bottle with a waterproof pen in the presence of the sample collector.
8. A sample log is maintained which records chronological information about sample identification and origin.

#### **Microbiology:**

- 1 The water analysis collection shall be done by the Medical Technologist assigned to the Microbiology Section.
- 2 The IPCU Nurse or its representative, the Engineering Safety Officer, and Laboratory Staff shall be present during the collection and ensure that proper collection protocol is followed. In the absence of one party, the collection process will not commence.
- 3 The units/parties concerned shall assign responsible people for the water collection.
- 4 The Medical Technologist shall collect the water specimen from a source determined by the units concerned.
  - 4.1 The Medical Technologist shall accompany the unit's point people to the collection area.
  - 4.2 The Laboratory ensures the integrity of the materials; required PPE is used and observed (like changing gloves at every collection point).
  - 4.3 Cleaning and disinfection of the collection processes shall be adhered to. The Infection, Prevention, and Control Unit is responsible for ensuring that the pre-collection processes are followed. The Engineering/Safety Officer is responsible for ensuring that the actual collection is not jeopardized. No other collecting container will be used except the




 <p>B.S. Aquino Drive, Bacolod City, Negros Occidental, 6100</p> <p>DR. PABLO O. TORRE MEMORIAL HOSPITAL</p>	Document Code:	DPOTMH-E-52-P10
	Effective Date:	09-30-2022
	Document Type:	Policy
	Page Number:	4 of 6
	Department/Section:	Laboratory Department
	Document Title:	<b>MICROBIOLOGICAL WATER ANALYSIS/TESTING POLICY</b>

standard autoclaved specimen and sterile specimen container from the laboratory.

- 4.4 The Medical Technologist shall proceed with the collection process with the approval and go signal of the IPCU representative and Engineering /Safety Officer.
- 5 The Medical Technologist shall proceed with the processing and analysis of the water specimen. Regular examination of water will have to be carried out in order to determine that standard sets are maintained.
  - 6 Water samples shall be representative of the whole water supply system (samples from the water source before and after treatment, if any, and from a reasonable number of points.
  - 7 Sterilized glass bottles are provided with either ground glass stoppers or plastic screw caps and shall be used for the collection of representative samples.
  - 8 The bottle, or sterile cap, shall remain closed until it is ready for filling. It shall be filled without rinsing and ample space (at least 2.5 cm) shall be left for mixing samples. The stopper or cap shall be replaced immediately and the protective paper re-secured around the bottle neck for additional protection.
  - 9 The tap shall be cleaned, free from attachments, and fully opened with water allowed to run to waste for a sufficient time to permit the flushing/clearing of the service lines. The sample shall be properly identified or labeled, then placed in an appropriate container before being brought to the laboratory.
  - 10 The minimum number of samples to be collected and examined periodically shall be based on the mode and source of water supply.
  - 11 The bacteriological analysis of water samples collected shall be initiated promptly after collection to avoid unpredictable changes. If samples cannot be processed within six (6) hours after collection, the use of ice coolers for storage of water samples during transport to the laboratory is recommended, or the sample shall be refrigerated to avoid further contamination.
  - 12 When a delay in bringing samples to the laboratory is likely, the samples can be filtered through a membrane filter at the site of collection. After filtration, the membrane is placed in a Petri dish using an appropriate medium.



 <p>B.S. Aquino Drive, Bacolod City, Negros Occidental, 6100</p> <p>DR. PABLO O. TORRE MEMORIAL HOSPITAL</p>	Document Code:	DPOTMH-E-52-P10
	Effective Date:	09-30-2022
	Document Type:	Policy
	Page Number:	5 of 6
	Department/Section:	Laboratory Department
	Document Title:	<b>MICROBIOLOGICAL WATER ANALYSIS/TESTING POLICY</b>

- 13 The Final Report shall be forwarded to the different areas concerned. The following information on the accompanying sample report form maintains the integrity of the samples.
  - 13.1 site of collection
  - 13.2 source of sample collection
  - 13.3 colony count reported in colony forming units/mL.
  - 13.4 methods used in counting.
- 14 In the event of unsatisfactory bacteriological findings, an immediate course of action shall be in place to have an easy solution immediately.
- 15 Materials or supplies needed for water analysis shall be autoclaved or sterilized.
- 16 The analysis shall be performed in a sterile specimen bottle.

#### **DOCUMENTATION:**

New Policy


#### **DISSEMINATION:**

1. Hospital Communicator
2. Policies and Procedures Manual

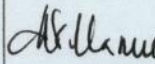
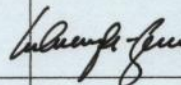


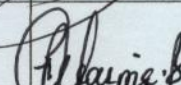
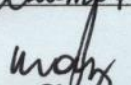
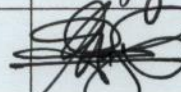
#### **REFERENCE:**

Training on Microbiological Analysis of Water. Department of Health (National Reference Laboratory)-East Avenue Medical Center.  
Medical Microbiology, Murray, Rosenthal, Pfaller. 2016.



 <p>B.S. Aquino Drive, Bacolod City, Negros Occidental, 6100</p> <p>DR. PABLO O. TORRE MEMORIAL HOSPITAL</p>	Document Code:	DPOTMH-E-52-P10
	Effective Date:	09-30-2022
	Document Type:	Policy
	Page Number:	6 of 6
	Department/Section:	Laboratory Department
	Document Title:	<b>MICROBIOLOGICAL WATER ANALYSIS/TESTING POLICY</b>

**APPROVAL:**

	Name/Title	Signature	Date
Prepared by:	<b>MONICA B. VILLANUEVA, RN, RMT, PhD</b> Laboratory Manager		9-12-2022
Verified:	<b>MELANIE ROSE B. ZERRUDO, MD, FPSP</b> Chairman, Department of Pathology		9-12-2022
Reviewed:	<b>DENNIS C. ESCALONA, MN, FPCHA, FPSQua</b> Quality Assurance Supervisor		09-12-22
Recommending Approval:	<b>ENGR. NOEL P. GARBO, FPCHA</b> Engineering and General Services Division Officer		9/12/22
	<b>ROSARIO D. ABARING, RN, MN, PhD, FPCHA</b> Ancillary Division Officer		09.12.2022
	<b>MA. ANTONIA S. GENSOLI, MD, FPPS, FPCHA</b> Vice President – Chief Medical Officer		9-27-22
Approved:	<b>GENESIS GOLDI D. GOLINGAN</b> President and CEO		9/28/22