CALAMBA WATER DISTRICT

TITLE: HETEROTROPHIC PLATE COUNT PROCESS

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1.0 PURPOSE

1.1 This documented information is for determining the density of aerobic and facultative anaerobic heterotrophic bacteria in water.

1.2 CWD shall implement production and service provision under controlled conditions. Controlled conditions shall include, as applicable:

a) the availability of documented information that defines:
1) the characteristics of the products to be produced, the services to be provided, or the activities to be performed;
2) the results to be achieved;
b) the availability and use of suitable monitoring and measuring resources;
c) the implantation of monitoring and measurement activities at appropriate stages to verify that criteria for control of processes or outputs, and acceptance criteria for products and services, have been met;
d) the use of suitable infrastructure and environment for the operation of processes;
e) the appointment of competent persons, including any required qualification;
f) the validation, and periodic revalidation, of the ability to achieve planned results of the processes for production and service provision, where the resulting output cannot be verified by subsequent monitoring or measurement;
g) the implementation of actions to prevent human error;
h) the implementation of release, delivery and post-delivery activities.

1.3 To use suitable means to identify outputs when it is necessary to ensure the conformity of products and services.

1.4 To identify the status of outputs with respect to monitoring and measurement requirements throughout production and service provision.

1.5 To control the unique identification of the outputs when traceability is a requirement, and shall retain the documented information necessary to enable traceability.

2.0 SCOPE

2.1 This documented information applies to Service Reservoirs, Water Treatment Works, Consumer's Taps nearest the meter, Refilling Stations and Water Vending Machines.

3.0 RESPONSIBILITY

3.1 The Head of Laboratory shall manage the administrative and technical operations of the laboratory.

3.2 The Laboratory Analyst must perform the microbiological test with minimum supervision, summarizes the data and prepares the report from the results.

4.0 DEFINITION OF TERMS

4.1 Colony Forming Units (cfu/ml) – average number of colonies per plate multiplied by the dilution factor

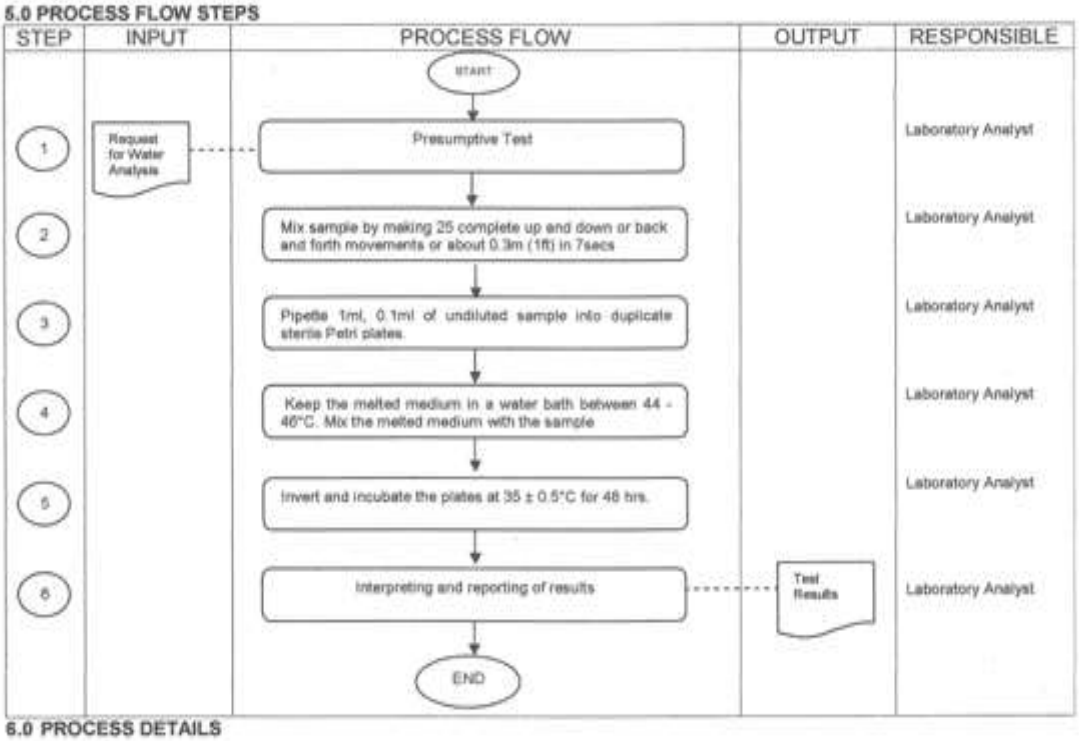
4.2 Dilution Factor – reciprocal of the volume of undiluted sample plated and is used to standardize the result according to the sample.

4.3 Aerobic bacteria- microorganisms that involve oxygen to survive

4.4 Heterotrophic bacteria – microorganism that cannot fix carbon from inorganic sources (such as carbon dioxide) but uses organic carbon for growth.

4.5 Dilution – It is the process of decreasing the concentration of a solute in solution, usually simply by mixing with more solvent

5.0 PROCESS FLOW STEPS



6.0 PROCESS DETAILS

6.1 Presumptive Test

6.1.1 Mix sample by making 25 complete up and down or back and forth movements or about 0.3m (1ft) in 7secs.

6.1.2 Pipette 1ml, 0.1ml of undiluted sample into duplicate sterile Petri plates.

6.1.3 Keep the melted medium in a water bath between 44 -46°C. Mix the melted medium with the sample by swirling in a figure eight motion

6.1.4 Invert and incubate the plates at 35 ± 0.5°C for 48 hrs.

6.2 Interpreting and reporting of results.

6.2.1 To obtain results multiply the **average number of colonies/plate** by the **dilution factor**. Report counts as cfu/ml.

6.2.2 Consider plates having between 30 – 300 colonies. However, this is not always the case so when counting and recording colonies choose the best situation that best describes the result

Actual Reading on Plate	Computation / Interpretation
No colonies	Report the count as less than one (<1) times the dilution factor for the largest volume of original sample used
1 - 30 /plate	count colonies as is
> 30 colonies or less than 10 colonies / cm^2	colonies in 13 squares (7 horizontal & 6 vertical) x 5 = cfu /ml
11 - 100 colonies / cm^2	count 4 representative squares then take the average x 65 = cfu /ml
more than 100 colonies / cm^2	Report as >6500 cfu / ml

6.3 **Preservation.**
CWD shall preserve the outputs during production and service provision, to the extent necessary to ensure conformity to requirements.

NOTE: Preservation can include identification, handling, contamination control, packaging, storage, transmission or transportation, and protection.

6.4 Post-delivery activities
CWD shall meet requirements for post-delivery activities associated with the products and services.
In determining the extent of post-delivery activities that are required, the organization shall consider:
a) statutory and regulatory requirements;
b) the potential undesired consequences associated with its products and services;
c) the nature, use and intended lifetime of its product and services;
d) customer requirements;
e) customer feedback.

NOTE: Post-delivery activities can include actions under warranty provisions, contractual obligations such as maintenance services, and supplementary services such as recycling or final disposal.

7.0 RECORDS RETENTION

7.1 Active Retention – indefinite retention period for current or active documents for both electronic and hardcopy Master Copy.

7.2 Inactive/Archival Retention – shall be kept for active three (3) years or may request for an extension as deemed necessary (hardcopy); for electronic/soft file; it shall be kept in a separate folder named "Obsolete Master Copy/Original".

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8.0 REFERENCE

8.1 ISO 9001:2015 QMS Standard
8.2 Philippine National Standards for Drinking Water 2007
8.3 Standard Methods for the Examination of Water and Wastewater 20th Edition

9.0 ATTACHMENTS

9.1 Request for Analyis Form

10.0 DISTRIBUTION LIST

Note 1: Select Relevant Recipient to Appear in below List.

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