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3.18   Total faecal coliform bacteria

Author/s and affiliations: Laura Wendling[1], Ville Rinta-Hiiro[1], Maria Dubovik[1], Arto Laikari[1], Johannes Jermakka[1], Zarrin Fatima[1], Malin zu-Castell Rüdenhausen[1], Peter Roebeling[2], Ricardo Martins[2], Rita Mendonça[2], Gerardo Caroppi[3,4], Carlo Gerundo[4], Francesco Pugliese[4], Maurizio Giugni[4], Marialuce Stanganelli[4], Vittoria Capobianco[5], Farrokh Nadim[5], Amy Oen[5]

[1] *VTT Technical Research Centre Ltd, P.O. Box 1000 FI-02044 VTT, Finland*

[2] *CESAM – Department of Environment and Planning, University of Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal*

[3] *Aalto University, Department of Built Environment, Espoo, Finland (gerardo.caroppi@aalto.fi)*

[4] *University of Naples Federico II (UNINA), Department of Civil, Architectural and Environmental Engineering, Naples, Italy*

[5] *Norwegian Geotechnical Institute (NGI), Oslo, Norway*

Total faecal coliform bacteria in NBS effluents	Water Management
Description and justification	Faecal coliform bacteria are a subgroup of a larger total coliform group referring to the Gram-negative, rod-shaped bacteria. Faecal coliform bacteria denote a group of thermotolerant coliform organisms, optional aerobic or anaerobic, which grow at 44 ± 0.5 °C and ferment lactose to produce acid and gas (Bartram & Pedley, 1996; Doyle & Erickson, 2006). Although coliform bacteria are easy to detect, their presence does not imply the faecal contamination due to the natural occurrence of some faecal coliform organisms of non-faecal origin. Thus, the pathogenic strains of *Escherichia coli (E. coli)* are usually analysed to determine the sanitary contamination of water

	(ISO, 2014). Presence of faecal coliform bacteria in the natural waters may indicate the faecal contamination and degradation of the water bodies originating from diffuse sources such as urban runoff and transport from sewer overflows (Davies et al., 1995; Davies & Bavor, 2000).
Definition	Observed number of faecal coliform colony units determined by direct counting (Colony Forming Unit (CFU)/100 mL or CFU/100 g) or most probable number (MPN) methods (MPN/100 mL or MPN/g)
Strengths and weaknesses	+ Almost always implies the faecal contamination of water + Standardized methodology for analyses - Analyses require expert knowledge and judgement
Measurement procedure and tool	a. Membrane filtration and direct counting The traditional way of evaluating the water samples for bacteria is the membrane filtration method. First, the water sample is filtered through a membrane, then the bacteria are cultured on an agar medium in a Petri dish and incubated at a specified temperature for a specified period of time depending on the type of bacteria analysed. Later, the number of the target organisms in the sample is calculated. The background bacterial growth may inhibit the enumeration of coliform bacteria, so this method is not deemed suitable for shallow and surface waters. b. Most probable number (MPN) method MPN is a statistical method used for enumeration of the viable target organisms by sequential inoculation and incubation in a liquid medium in ten-fold dilutions. Several assumptions must be made when using the MPN method, such as assuming the random distribution of the organisms in the sample (implying that no bacterial clustering and repelling is present), and assuming that the tubes will produce detectable growth. The advantages of the MPN method include the possibility for adjustment of the accuracy of the results when increasing the number of tubes per dilution, and larger sample size than in the plate count method. The MNP method is suitable for all types of water.
Scale of measurement	Plot scale
Data source	
Required data	Microbiological analyses of water
Data input type	Quantitative

Data collection frequency	At minimum before and after NBS implementation
Level of expertise required	High – requires familiarity with the laboratory practices and expertise for conducting the microbiological analyses and evaluating the outcomes
Synergies with other indicators	Together with other *Water Management* indicators determines the overall status of water quality in an area
Connection with SDGs	SDG 11 Sustainable cities and communities, SDG 13 Climate action, SDG 14 Life below water
Opportunities for participatory data collection	Participatory data collection is possible under direct qualified staff supervision
Additional information	
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