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Water reuse — Vocabulary

Réutilisation de l'eau — Vocabulaire

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 282, *Water reuse*.

This second edition cancels and replaces the first edition (ISO 20670:2018), which has been technically revised.

The main changes are as follows:

— certain definitions modified;

— addition of entries 3.1, 3.9, 3.16, 3.31, 3.34, 3.35, 3.51, 3.52, 3.54, 3.55, 3.56, 3.58, 3.61, 3.62, 3.65, 3.67, 3.70, 3.78, 3.82, 3.97, 3.99, 3.100, 3.101, 3.102 and 3.103.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Water reuse is the use of treated wastewater which, in turn, can have as its source surface water, groundwater, desalinated brackish water, desalinated seawater and reuse water, which can include treated wastewater, greywater, rainwater and stormwater.

With economic development, climate change, increases in population and rapid urbanization, water has become a strategic resource, especially in arid and semi-arid regions. Water shortages are considered as one of the most serious threats to sustainable development of society. Although conservation can reduce per capita demand, the remaining supplies can be insufficient to meet overall water demand needs. To address these shortages, reclaimed water is increasingly being considered for use to satisfy water demands that do not require potable water quality, and this strategy has proven useful in increasing the reliability of long-term water supplies in many water-scarce areas of the world.

Reclaimed water is used to satisfy a significant proportion of the water demands in rural and urban areas in many countries, such as agricultural irrigation, landscape irrigation, industrial reuse, groundwater recharge, toilet and urinal flushing, firefighting and fire suppression, ornamental water features and various other urban uses, including direct and indirect potable reuse.

There is a rapidly growing global market for water reuse, which inevitably demands International Standards. Today, many regions of the world face water shortages. The reality of water reuse and the lack of uniform and consistent water quality standards are raising concerns for human health and the environmental and societal implications of water reuse across the world. Consequently, there is a growing need for international standardization from suppliers, users, regulators and all stakeholders. A coherent approach to the description of water reuse activities and the use of water reuse terminology from this document will be of benefit to all users and stakeholders.

The objective of this document is to ensure a coherent approach to the description of water reuse activities and the use of water reuse terminology. Its purpose is to foster mutual understanding common to the different stakeholders.

An important new concept in water reuse is the “fit for purpose” approach, which entails the production of reclaimed water to a quality that meets the needs of the intended end uses.

This document presents terms and definitions in the following areas:

— water reuse of any kind and for any purpose;

— treated wastewater use for irrigation purposes;

— water reuse in urban areas;

— risk and performance evaluation of water reuse systems;

— water reuse for industrial purposes.

Water reuse — Vocabulary

1 Scope

This document defines terms and definitions commonly used in water reuse standards. It is applicable to all types and sizes of water reuse facilities and systems and to all types of stakeholders involved in water reuse.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
advanced oxidation process
AOP
process (3.70) that generates hydroxyl radicals in sufficient quantity to remove organics by oxidation

3.2
advanced treatment
treatment for the removal of total dissolved solids and/or trace *constituents* (3.17) as required for specific water reuse applications [e.g. activated carbon adsorption, reverse osmosis and *advanced oxidation processes* (3.1)]

3.3
agriculture
science or practice of farming, including cultivation of the soil for the growing of crops and the rearing of animals to provide food or other products

3.4
aquifer
subsurface layer or layers of rock or other geological strata of sufficient porosity and permeability to allow either a significant flow of groundwater or the abstraction of significant quantities of groundwater

[SOURCE: Directive 2000/60/EC, Article 2, 11]

3.5
augmentation
process (3.70) of using *reclaimed water* (3.81) to increase the amount of water flowing through a surface body of water or *aquifer* (3.4) (i.e. reservoir, lake, river, stream, wetland and/or groundwater basin) for beneficial purposes

3.6
background water
freshwater (3.36) supplied for domestic, institutional, commercial and industrial use, from which *wastewater* (3.105) is generated

3.7
barrier
means that reduces or prevents health and environmental *risks* (3.83) by preventing contact with the treated *wastewater* (3.105) and/or by improving its quality

3.8
beneficial use
water use for overall advantages, which include environmental health and wellbeing to promote sustainability

EXAMPLE Municipal water supply, agricultural and urban irrigation, industrial applications, navigation, stream *augmentation* (3.5) for fish and wildlife habitat enhancement, toilet and urinal flushing, recreational water contact.

3.9
biodosimetry
procedure of measuring the UV reduction equivalent dose of a specific microorganism in a UV unit and comparing the results to the known UV dose-response curve of this microorganism determined by bioassay (typically collimated beam methods)

3.10
biofilm
surface slime caused by growth of surface-attached microorganisms within their extracellular polymeric substances

3.11
biological stability
maintaining microbial water quality from the point of water production up to the point of consumption

3.12
blackwater
wastewater (3.105) originating from sanitary sources (e.g. toilets, urinals and bidets), as well as drainage from food preparation and utensil-cleaning activities (e.g. kitchen sinks and dishwashers)

3.13
brackish water
water containing dissolved solids at a concentration higher than acceptable standards for intended use

Note 1 to entry: The concentration of total dissolved solids in brackish water can vary from 1 000 mg/l to 10 000 mg/l. Brackish water is less saline than sea water [1 000 to 10 000 mg/l of total dissolved solids for brackish vs up to 35 000 mg/l for sea water].

Note 2 to entry: The concentration of total dissolved solids of many brackish waters can vary considerably over space and/or time.

Note 3 to entry: See Reference [19].

[SOURCE: ISO 14046:2014, 3.1.2, modified — Definition and Note 1 to entry modified; Note 3 to entry added.]

3.14
centralized water reuse system
water reuse system typically applied on a large scale, such as municipal level, and including the entire *reclaimed water* (3.81) source, treatment, distribution, storage and monitoring components to produce a final treated effluent for its intended uses

3.15
chemical stability
tendency of the treated water to possibly have reactions during the water distribution, storage or use processes, and the potential scaling, fouling and corrosion effects on pipes and equipment to which the water is exposed

Note 1 to entry: See Reference [18].

Note 2 to entry: Examples of reactions include deposition of calcium carbonate and the formation of *disinfection* (3.24) by-products.

3.16
concentrate
stream exiting a membrane module containing the constituents rejected by the membrane

Note 1 to entry: Concentrate stream contains increased concentrations of *constituents* (3.17) over the feed stream due to the accumulation of rejected constituents by membranes in the feed stream.

3.17
constituents
individual or group of physical, chemical or biological substances or matter present in water that are the target of removal, reduction or transformation in the *treatment process* (3.94)

3.18
contaminant
physical, chemical, biological or radiological substance or matter in water

Note 1 to entry: The presence of contaminants does not necessarily indicate that the water poses a *health risk* (3.41).

3.19
critical control point
CCP
point, step or procedure at which control can be applied and is essential to prevent or eliminate a *hazard* (3.38) or reduce it to an acceptable level

[SOURCE: ISO 5667-13:2011, 3.3, modified — Abbreviated term “CCP” added.]

3.20
cross-connection
actual or potential connection between a potable water system and any source or system that can or does contain *non-potable water* (3.63) or other substances that pose a public *health risk* (3.41)

3.21
decentralized water reuse system
water reuse system applied on a small scale

EXAMPLE Water reuse system which works offline from a centralized system, water reuse system at private level. In this context, decentralized water reuse systems refer to specialized reuse projects for individual residential homes, clusters of homes or commercial or institutional facilities.

3.22
desalination
partial or near-complete removal of ionic species from seawater or *brackish water* (3.13) and treated wastewater, usually to make it drinkable or usable as processing water, cooling water or irrigation water

3.23
direct reuse
production and supply of *reclaimed water* (3.81) to a *distribution system* (3.25) via pipelines, storage tanks and other infrastructure for reuse purposes

3.24
disinfection
process (3.70) that destroys, inactivates or removes microorganisms until an appropriate level is reached

3.25
distribution system
piping network required to deliver water from a transmission pipeline to the points of connection to users' plumbing systems

Note 1 to entry: Pumping stations are included as part of the distribution system.

3.26
environment
surroundings in which an *organization* (3.64) operates, including air, water, land, other natural resources, flora, fauna, humans and their interrelationships

Note 1 to entry: Surroundings in this context range from the environment within an *organization* (3.64) to the global system in the particular geographical area that can be impacted by *water reuse* (3.109).

Note 2 to entry: Surroundings can be described in terms of biodiversity, ecosystems, climate or other characteristics.

[SOURCE: ISO 14001:2015, 3.2.1, modified — Note 1 to entry modified.]

3.27
environmental aspect
element or characteristic of an activity, product or service that interacts or can interact with the *environment* (3.26)

Note 1 to entry: Environmental aspects can cause *environmental impacts* (3.28). In the case of *water reuse* (3.109), they can have either beneficial impacts or adverse impacts.

[SOURCE: ISO 14001:2015, 3.2.2, modified — Definition and Note 1 to entry revised; Note 2 to entry deleted.]

3.28
environmental impact
change to the *environment* (3.26), whether adverse or beneficial, wholly or partially resulting from one or more *environmental aspects* (3.27)

Note 1 to entry: As a rule, *water reuse* (3.109) has beneficial environmental impacts, but potential adverse impacts can also occur depending on *reclaimed water* (3.81) quality and the sensitivity of the *environment* (3.26) of concern.

[SOURCE: ISO 14001:2015, 3.2.4, modified — Definition revised; Note 1 to entry added.]

3.29
exposure assessment
estimation (qualitative or quantitative) of the magnitude, frequency, duration, route and extent of exposure to one or more contaminated media

3.30
filtration
physical separation of solid particles from water by passing the water through a physical porous *barrier* (3.7) to trap and separate suspended solids from the water

Note 1 to entry: Examples of *barriers* (3.7) include media bed, surface or depth filter, screen and membrane.

3.31
flux
membrane throughput, usually expressed in volumes of *permeate* (3.65) per unit membrane surface area per unit time, such as litres per square metre per hour ($l/m^2/h$) at a given temperature or normalized temperature (often 20 °C)

Note 1 to entry: It can also be expressed in number of moles, volume or mass of a specified component per unit time per unit membrane surface area.

3.32
fodder crops
crops for animal consumption

EXAMPLE Forage crops.

3.33
food crops
crops for human consumption

Note 1 to entry: Food crops are often further classified according to whether the food crop is to be cooked, processed or consumed raw.

3.34
fouling
processes (3.70) leading to deterioration of membrane flux due to surface or internal blockage of the membrane

3.35
functional requirement
requirement related to the improvement of water quality by a *treatment technology* (3.96)

3.36
freshwater
naturally occurring water on the Earth's surface (in ice, lakes, rivers and streams) and underground as groundwater in *aquifers* (3.4)

Note 1 to entry: Freshwater includes desalinated seawater and desalinated *brackish water* (3.13)

Note 2 to entry: Freshwater excludes seawater and *brackish water* (3.13).

3.37
greywater
graywater
wastewater (3.105) from household baths and showers, hand basins and kitchen sinks

Note 1 to entry: Greywater includes used water from showers, bathtubs, bathrooms or toilet wash basins and water from clothes washing and laundry tubs.

Note 2 to entry: Greywater excludes used water from toilets and urinals or *wastewater* (3.105) from food waste (i.e. kitchen sinks and food waste grinders).

3.38
hazard
source or situation with a potential for harm in terms of human injury or ill health (both short and long term), damage to property, the *environment* (3.26), soil and vegetation or a combination of these

[SOURCE: ISO 30000:2009, 3.4, modified — Definition revised.]

3.39
hazard analysis and critical control point
HACCP
systematic methodology that recognizes and reviews the *hazards* (3.38) throughout a *process* (3.70) and identifies *critical control points* (3.19) where preventative measures or set-points can be established and controlled to ensure product quality

Note 1 to entry: The main objective is to establish a monitoring programme that can effectively manage the *risks* (3.83) of each individual system in a *process* (3.70) and establish effective procedures to react to excursions of *critical control points* (3.19) to ensure end-product quality.

3.40
hazard identification
process (3.70) of recognizing the existence of *hazards* (3.38) and defining their characteristics

[SOURCE: ISO 21101:2014, 3.27]

3.41
health risk
combination of the likelihood of occurrence of harm to health and the severity of that harm

[SOURCE: ISO 10993-17:2002,[1)] 3.8]

3.42
health risk analysis
use of available information to identify health *hazards* (3.38) and to estimate *health risk* (3.41)

[SOURCE: ISO 10993-17:2002, 3.9]

3.43
indicator microorganism
indirect measure or indicator to infer whether a pathogenic (disease-causing) microorganism is present

3.44
indirect potable reuse
augmentation (3.5) of a drinking water source (surface or groundwater) with *reclaimed water* (3.81), followed by an environmental buffer that precedes drinking water treatment

3.45
indirect reuse
use of *reclaimed water* (3.81) after discharge in groundwater or surface water, where they can be mixed with water sources before *beneficial uses* (3.8)

Note 1 to entry: Indirect *water reuse* (3.109) does not include unplanned uses.

3.46
industrial reuse
reuse of *industrial wastewater* (3.47) or *municipal wastewater* (3.60) to satisfy industrial water requirements

EXAMPLE Cooling water from a power generation facility used for manufacturing purposes by a neighbouring industry.

Note 1 to entry: The reuse can occur within a particular industrial facility, as well as between industrial facilities of different natures.

3.47
industrial wastewater
wastewater (3.105) discharge resulting from any industrial activity

1) Cancelled and replaced by ISO 10993-17:2023.

3.48
irrigation project
design, development, construction, selection of equipment, operation and monitoring of works to provide suitable water for irrigation

3.49
irrigation system
assembly of pipes, components and devices installed in the field for the purpose of irrigating a specific area

3.50
landscape
visible feature of an area of land, often considered in terms of its aesthetic appeal, such as public and private gardens, parks, road vegetation (including lawns) and turfed recreational areas

3.51
membrane bioreactor
MBR
integrated wastewater *treatment process* (3.94) combining a suspended growth biological treatment and a *membrane filtration* (3.53) system [*microfiltration* (3.56) or *ultrafiltration* (3.97) membrane] replacing a conventional secondary clarifier

Note 1 to entry: The microfiltration or ultrafiltration membrane is submerged in a biological reactor (submerged MBR). Another configuration has pressurized membrane modules externally coupled to the bioreactor, with the biomass recirculated between the membrane modules and the bioreactor by pumping (side-stream MBR).

3.52
membrane cleaning
operation to recover membrane performance using backwashing, flushing with or without chemical reagents

3.53
membrane filtration
separation of the components of a fluid by semipermeable membranes with *pore size* (3.67) less than or equal to 10 µm and typically below 0,45 µm under pressure or vacuum

Note 1 to entry: Includes the *processes* (3.70) of *reverse osmosis* (3.82), *utrafiltration* (3.97), *nanofiltration* (3.61) and *microfiltration* (3.56).

Note 2 to entry: There are two types of membrane filtration: pressure-driven filtration and vacuum-driven filtration.

Note 3 to entry: Membrane filtration can also be considered as *disinfection* (3.24), according to the log units of pathogen reduction that it achieves.

3.54
membrane integrity test
non-destructive physical test that can be correlated to the membrane retention capability of the membrane system

3.55
membrane rejection rate
relative measure of how much of the target *constituent* (3.17) that was initially in the feed water is separated from the liquid by the membrane

Note 1 to entry: Rejection rate is generally expressed by $1 - C_2/C_1$, where C_1 is feed concentration and C_2 is permeate concentration.

Note 2 to entry: To make the guideline simple, the word “membrane” is frequently omitted, depending on the context.

3.56
microfiltration
MF
pressure-driven membrane-based separation *process* (3.70) designed to remove particles and macromolecules in the approximate range of 0,05 µm to 2 µm

3.57
minimum treatment requirement
minimum treatment to be adopted to achieve the water quality requirements for protecting and maintaining safe, reliable and stable *reclaimed water* (3.81) use

3.58
molecular weight cut-off
MWCO
rating of a membrane based on the size of uncharged solutes that is 90 % retained by a membrane

Note 1 to entry: Molecular weight cut-off is also referred to as nominal molecular weight cut-off (NMWCO).

Note 2 to entry: Typically expressed in Daltons.

3.59
multiple barrier concept
provision of multiple safeguards to maintain finished water quality *reliability* (3.79) to the point of use

EXAMPLE Source control, redundant systems and *treatment processes* (3.94) arranged sequentially as well as monitoring.

3.60
municipal wastewater
water arising from any combination of domestic and commercial activities, surface runoff and any accidental sewer inflow or infiltration water

Note 1 to entry: Municipal wastewater includes collected *stormwater* (3.91) and water discharged to the *environment* (3.26) or sewer.

3.61
nanofiltration
NF
cross-flow *process* (3.70) with pore sizes designed to remove selected salts and most organics above about 300 molecular weight range

Note 1 to entry: Nanofiltration is sometimes referred to as loose *RO* (3.82).

Note 2 to entry: Nanofiltration is a pressure-driven separation *process* (3.70) in which particles and dissolved molecules smaller than about 2 nm are rejected.

3.62
non-functional requirement
requirement that specifies criteria or constraints on the design or implementation of a *treatment technology* (3.96)

3.63
non-potable water
water that is not of drinking water quality according to local jurisdiction

3.64
organization
person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives

Note 1 to entry: The concept of organization includes, but is not limited to, sole-trader, company, corporation, firm, enterprise, authority, partnership, association, charity or institution, or part or combination thereof, whether incorporated or not, public or private.

[SOURCE: ISO 9000: 2015, 3.2.1, modified — Note 2 to entry deleted.]

3.65
permeate
portion of the feed stream which passes through a membrane

3.66
pollutant
substance which either alone or in combination with other substances or through its products of degradation or emissions can have a harmful effect on human health or the *environment* (3.26)

[SOURCE: ISO 16000-32:2014, 3.7, modified — Definition revised.]

3.67
pore size
size of the openings in a porous membrane, expressed either in a nominal (average) or absolute (maximum) value, typically measured in µm

3.68
potable reuse
use of high-quality *reclaimed water* (3.81) as a *raw water* (3.75) source for drinking water treatment and *distribution systems* (3.25)

3.69
potable water
water that meets applicable drinking water standards and is safe for drinking, washing and food preparation

3.70
process
set of interrelated or interacting activities that use inputs to deliver an intended result

[SOURCE: ISO 9000:2015, 3.4.1, modified — Notes to entry deleted.]

3.71
public health aspect
element of an organization's activities, projects or products that can interact with public health

3.72
public health impact
change to public health, whether adverse or beneficial, wholly or partly resulting from an organization's activities, projects or products

3.73
public health parameter
quantifiable attribute of a *public health aspect* (3.71)

3.74
rainwater
water arising from atmospheric precipitation which has not yet made contact with the surface

3.75
raw water
water that is supplied to a water *treatment process* (3.94) for the purpose of removing *constituents* (3.17) that would otherwise impair its intended *beneficial use* (3.8)

3.76
receptor
defined entity that is vulnerable to the adverse effect(s) of a hazardous substance or agent

EXAMPLE Human, animal, water, vegetation, building services.

[SOURCE: ISO 11074:2015, 3.3.29]

3.77
recycled water
water which has been previously used and is then subsequently used for beneficial purposes with or without treatment prior to the subsequent use

Note 1 to entry: The terms "recycled water" is often used as a synonym for *"reclaimed water"* (3.81) or *"reuse water"* (3.81); however, the latter two terms refer to water that has been treated, whereas "water recycling" refers to using water again for beneficial purposes with or without treatment.

3.78
reduction equivalent dose
dose of UV in a given device which is determined by *biodosimetry* (3.9)

Note 1 to entry: See "*UV dose*" (3.100).

Note 2 to entry: This UV dose is determined by measuring the inactivation of a challenge microorganism after exposure to UV light in a UV unit and comparing the results with the known UV dose response curve of the same challenge organism determined via Bench scale collimated beam testing.

3.79
reliability
<asset, process> probability that a device, system or *process* (3.70) will perform its prescribed function without failure for a given time when operated correctly in a specified *environment* (3.26)

[SOURCE: ISO 24512: 2007, 2.38]

3.80
restricted irrigation
irrigation of areas in which public access during irrigation with *reuse water* (3.81) can be controlled, such as some golf courses, cemeteries and highway medians

3.81
reuse water
reclaimed water
wastewater (3.105) that has been treated to meet a specific water quality level for intended *beneficial use* (3.8)

3.82
reverse osmosis
RO
separation *process* (3.70) where one component of a solution is removed from another component by flowing the feed stream under pressure across a semipermeable membrane that causes selective movement of solvent against its osmotic pressure difference

Note 1 to entry: Reverse osmosis removes ions based on electro chemical forces, colloids and organics down to 150 molecular weight. It is also called hyperfiltration.

3.83
risk
effect of uncertainty on objectives, including the potential for adverse effects of exposure to *hazards* (3.38)

[SOURCE: ISO Guide 73:2009, 1.1, modified — Definition revised and notes to entry deleted.]

3.84
risk analysis
process (3.70) to comprehend the nature of *risk* (3.83) and to determine the level of risk

[SOURCE: ISO Guide 73:2009, 3.6.1, modified — Notes to entry deleted.]

3.85
risk assessment
overall *process* (3.70) comprising a *risk analysis* (3.84) and a *risk evaluation* (3.87)

[SOURCE: ISO/IEC Guide 51:2014, 3.11]

3.86
risk characterization
evaluation and conclusion based on the *hazard* (3.38) identification and the exposure and effect assessment

[SOURCE: ISO 15800:2019, 3.19]

3.87
risk evaluation
process (3.70) of comparing the results of *risk analysis* (3.84) with risk criteria to determine whether the *risk* (3.83) and/or its magnitude is acceptable or tolerable

[SOURCE: ISO Guide 73:2009, 3.7.1, modified — Note 1 to entry deleted.]

3.88
risk management
coordinated activities to direct and control an *organization* (3.64) with regard to *risk* (3.83)

[SOURCE: ISO Guide 73:2009, 2.1]

3.89
source water
wastewater (3.105) that is treated in order to generate or supply *reclaimed water* (3.81)

EXAMPLE Secondary treated wastewater, raw sanitary sewage.

3.90
stakeholder
interested party
individuals, groups, *organizations* (3.64) or agencies with an interest in, involved in and/or affected by water reuse activities, developments and/or decisions

3.91
stormwater
water resulting from *rainwater* (3.74), melted snow and ice draining from roofs, roads, footpaths and all other ground surfaces

Note 1 to entry: Stormwater can either be collected and stored for direct use or collected and discharged into a sewer system or *environment* (3.26) and/or infiltrate into the soil.

3.92
surrogate parameter
quantifiable change of a bulk parameter that can measure the performance of a *treatment technology* (3.96) in removing a health or environmental *hazard* (3.38)

3.93
thermo-tolerant coliform
faecal coliform
coliform organism that can ferment lactose to produce acid and gas, and has the same fermentative biochemical properties at 44 °C as they have at 37 °C

Note 1 to entry: In practice, some organisms with these characteristics cannot be of faecal origin and the term "thermotolerant coliform" is, therefore, more correct and is becoming more commonly used. Nevertheless, the presence of thermotolerant coliforms nearly always indicates faecal contamination.

Note 2 to entry: See ISO 6107 and ISO 9308-1.

3.94
treatment process
unit *process* (3.70) designed to improve the water quality by physical, biological and/or chemical means

3.95
treatment system
set of interrelated or interacting unit *treatment processes* (3.94)

3.96
treatment technology
wastewater (3.105) treatment unit process or group of integrated unit processes designed to improve the water quality by physical, biological and/or chemical means

3.97
ultrafiltration
UF
pressure-driven *process* (3.70) employing semipermeable membrane under hydraulic pressure gradient for the separation components in a solution

Note 1 to entry: The pores of the membrane are of a size smaller than 0,1 mm, which allows passage of the solvent(s) but retains non-ionic solutes based primarily on physical size, not chemical potential.

3.98
unrestricted irrigation
irrigation of areas where public access during irrigation is not restricted

Note 1 to entry: Unrestricted irrigation often requires higher water quality than *restricted irrigation* (3.80) to deal with the *health risks* (3.41) associated with the likelihood of public contact with the *reclaimed water* (3.81).

EXAMPLE Examples of such areas include gardens and playgrounds.

3.99
UV disinfection system
combination of UV *disinfection* (3.24) units with associated controls and instrumentation

3.100
UV dose
UV fluence
amount of UV energy given as the time integral of the fluence rate or irradiance (W/m^2)

Note 1 to entry: The value is given in units of mJ/cm^2 or J/m^2.

3.101
UV intensity sensor
UV irradiance meter or radiometer instrument to measure *UV irradiance* (3.102)

3.102
UV irradiance
UV fluence rate
UV intensity
UV output emitted from a given light source and entering a unit area of the irradiated surface

Note 1 to entry: The value is typically given in W/m^2 or mW/cm^2.

Note 2 to entry: The terms "UV irradiance", "fluence rate" and "intensity" are often used to mean the same thing.

Note 3 to entry: For details, see Reference [16].

3.103
UV transmittance
fraction of photons in the UV spectrum transmitted through a material such as water or quartz

Note 1 to entry: It is preferable that an online ultraviolet transmittance (UVT) sensor be installed and used to verify UVT.

Note 2 to entry: The wavelength of the UVT (unit %) should be specified, often using a path length of 1 cm. The measurement is calibrated compared to ultra-pure water (ISO 3696 grade 1 or equivalent).

Note 3 to entry: UVT is related to the UV absorbance (A) by the following (for a 1-cm path length): $\%\ UVT = 100 \times 10^{-A}$.

3.104
verification
testing of a bench-scale, pilot or full-scale system to measure and compare to the design goals

3.105
wastewater
water arising from any combination of domestic, industrial, commercial or institutional activities, surface runoff and any sewer inflow or infiltration water, and which can include collected *stormwater* (3.91)

Note 1 to entry: Runoff in the wastewater definition is from point source and non-point pollutant sources.

3.106
wastewater treatment plant
WWTP
facility designed to treat *wastewater* (3.105) by a combination of physical, chemical and biological *processes* (3.70), for the purpose of reducing the organic, inorganic and some microbial *contaminants* (3.18) in the wastewater

Note 1 to entry: There are different levels of *wastewater* (3.105) treatment, according to the desired quality of treated wastewater and the level of contamination.

3.107
water reclamation
process (3.70) of treating and processing *wastewater* (3.105) to make it suitable for *beneficial use* (3.8)

3.108
water recycling
using water again for beneficial purposes, with or without treatment

3.109
water reuse
use of treated *wastewater* (3.105) for *beneficial use* (3.8)