8.0 Glossary of Terminology and Abbreviations

Acre-foot (AF): A unit commonly used for measuring the volume of water, equal to the quantity of water required to cover one acre to a depth of one foot. An acre-foot is 325,851 gallons and is considered enough water to meet the needs of two families of four for one year.

Advanced Treatment: Additional treatment provided to remove suspended and dissolved substances after conventional secondary treatment. Often this term is used to mean additional treatment after tertiary treatment for the purpose of further removing contaminants of concern to

public health. This may include membrane filtration, reverse osmosis (RO), advanced oxidation, and disinfection with ultraviolet light (UV) and hydrogen peroxide (H_2O_2).

AF: Acre-foot.

AFY: Acre-feet per year. The amount of water (in acre-feet) used, bought or produced in one year.

City of San Diego Assembly on Water Reuse: American Assembly-style workshop that brought together diverse stakeholders to examine public policy questions and recommend action.

Aquifer: A geologic formation that stores water and yields significant quantities of water to wells or springs.

Assembly: City of San Diego Assembly on Water Reuse.

Augmentation: The process of adding recycled water that has received advanced treatment to an existing raw water supply (such as a reservoir, lake, river, wetland, and/or groundwater basin) that could eventually be used for drinking water after further treatment.

Avoided costs: The cost savings that may accrue to a water provider if a given water reuse project delays or eliminates the need for a water or wastewater system improvement project.

Beneficial use (of water): A use of water resulting in appreciable gain or benefit to the user, consistent with state law, which varies from one state to another. In California, beneficial uses of waters of the state that may be protected against quality degradation include, but are not necessarily limited to, domestic, municipal, agricultural, and industrial supply, power generation, recreation, aesthetic enjoyment, navigation, as well as preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. (Water Code, Section 13050(f)).

Blending: Mixing or combining one water source with another.

Caltrans: California Department of Transportation.

City: City of San Diego.

Contaminant: An undesirable substance not normally present or an unusually high concentration of a naturally occurring substance in water, soil or other environmental medium.

Costs: The capital and operating expenses of constructing and operating a water reuse project. They usually consist of (1) Capital costs, the initial expenditures to design and construct project facilities; and (2) Operating costs, the ongoing annual expenses associated with operating the project, including labor, material, and energy costs.

Costs of Inaction: The costs of not implementing a proposed project. For reuse projects, these costs may include the cost of obtaining other water supplies to meet a community's needs.

Council: The City Council of San Diego.

CWA: Federal Clean Water Act.

Demineralization: A process that removes dissolved minerals from water. In some cases, a percentage of water is demineralized and blended back in with the original source water to dilute the level of dissolved solids in the source water.

Detention time: In storage reservoirs, the length of time water will be held before being used.

DHS: California Department of Health Services.

Direct Injection: Injecting recycled water through an injection well directly into a groundwater basin. If the water will later be used for drinking, the recycled water will receive advanced treatment prior to injection.

Direct potable reuse: The addition of advanced treated recycled water (purified water) directly to a potable water distribution system.

Disinfection: Removal or inactivation of any organism.

Disinfection By-Products: (1) Chemicals that are formed when a disinfectant such as chlorine is added to water that contains organic matter, usually from decaying plant or animal material. (2) Compounds that form when chlorine combines with naturally occurring or pollution-derived organic, carbon-based materials, such as the acids from soils or decaying vegetation and bromide (salt).

Drinking Water: See "Potable Water".

Endocrine Disrupting Compounds (EDCs): Chemicals that can interfere with the normal hormone function in humans and animals.

EPA: U.S. Environmental Protection Agency.

Epidemiological: Dealing with the scientific study of the incidence, control and spread of disease in a population.

Emergency Storage Project (ESP):, a multi-facility program being implemented by the San Diego County Water Authority to increase raw water storage capacity in San Diego County.

ESP: See "Emergency Storage Project."

Firm supply: A water supply is considered firm if it is a reliable source for a community, either by legal rights or by natural availability. Recycled water is usually considered to be a firm supply as its source remains available even during dry years.

Graywater: Wastewater from household bathroom or restroom sinks, clothes washers, bathtubs, or showers. Graywater may undergo minimal on-site treatment and may be used for underground irrigation when permitted by local health officials.

Groundwater: Water beneath the Earth's surface that could supply wells or natural springs.

Groundwater Basin: A groundwater reservoir, defined by an overlying land surface and the underlying aquifers that contain water stored in the reservoir. In some cases, the boundaries of successively deeper aquifers may differ and make it difficult to define the limits of the basin.

Groundwater Recharge: Naturally or artificially adding water back into a ground water basin by allowing the water to seep through the ground or by injection.

HCF: Hundred cubic feet, equal to 748 gallons.

IAP: Independent Advisory Panel formed by the National Water Research Institute to provide technical oversight of the Water Reuse Study.

IBWC: International Boundary and Water Commission.

IID: Imperial Irrigation District.

Imported Water: Water transported from one region or area to another.

Indirect Potable Reuse (IPR): The blending of advanced treated recycled water into a natural water source (groundwater basin or reservoir) that could be used for drinking (potable) water after further treatment.

Infill: Increase water reuse demand through connection of large users within 1,320 feet (quarter-mile) of the existing reclaimed water pipeline.

IPR: Indirect potable reuse.

IX: Ion exchange.

MBR: Membrane bioreactor (a type of biological wastewater treatment process).

MCL: Maximum Contaminant Level as defined in the EPA Drinking Water Standards.

MF: Microfiltration.

MG: Million gallons.

MGD: Million gallons per day.

M&I: Municipal and Industrial.

Microfiltration (MF): The separation or removal from a liquid of particulates and microorganisms in the size range of 0.1 to 2 microns in diameter. (A micron is a millionth of a meter. A sheet of ordinary 20-weight copier paper is about 90 microns thick.)

Multi-Barrier Approach: Treatment barriers designed to remove various types of contaminants using independent processes, insuring that treatment will not be compromised if any process were to fail.

Multiple Treatment Barriers: Each barrier is designed to provide substantial protection with redundant barriers for each type of treatment. A requirement for multiple barriers assures the overall water treatment process will remain effective if one treatment barrier were to fail.

MWD: Metropolitan Water District of Southern California.

MWWD: City of San Diego Metropolitan Wastewater Department.

National Pollutant Discharge Elimination System (NPDES): The program established by the Federal Clean Water Act that requires all sources of pollution discharging into any "waters of the United States" to obtain a permit issued by the Environmental Protection Agency or a state agency authorized by the federal agency. The NPDES permit lists permissible discharges and/or the level of cleanup technology required for wastewater.

NCWRP: North City Water Reclamation Plant.

Non-potable Reuse: Includes all recycled water reuse applications except those related to drinking water.

NPDES: National Pollutant Discharge Elimination System.

NRC: National Research Council.

NWRI: National Water Research Institute.

O&M: Operation and Maintenance.

Ocean Outfall: A large pipeline used to dispose of treated wastewater several miles offshore.

OEHHA: Office of Environmental Health Hazard Assessment (State of California).

Operational reliability: The reliability of the City's water treatment and distribution systems to avoid upsets and to continue to serve customers even with individual system elements out of service for maintenance or repair.

OPRA: Federal Ocean Pollution Reduction Act**.**

OWD: Otay Water District.

Pathogens: Disease-causing organisms (generally viruses, bacteria, protozoa, or fungi).

Peak: An identified period of time when the maximum amount of water is used.

Peroxide (H_2O_2). Hydrogen peroxide.

PhACs: Pharmaceutically-active compounds.

PPCPs: Pharmaceuticals and personal care products.

Potable Water: Synonymous with *drinking water*. Specifically, fresh water that meets the level of quality as established in the EPA Drinking Water Standards.

Poway: City of Poway.

Primary Treatment: The removal of particulate materials from domestic wastewater, usually by allowing the solid materials to settle as a result of gravity. Typically, the first major stage of treatment encountered by domestic wastewater as it enters a treatment facility. Also, any process used for the decomposition, stabilization, or disposal of sludge produced by settling.

PUAC: Public Utilities Advisory Committee.

Purified water: Water that undergoes advanced treatment to a water quality suitable for augmentation to a drinking water source.

Reclaimed Water: The end product of wastewater reclamation that meets water quality requirements for biodegradable materials, suspended matter, toxicants, and pathogens. Reclaimed water is sometimes another name for recycled water.

Recycled Water: Reclaimed water that meets appropriate water quality requirements and is reused for a specific purpose**.**

Repurified Water: Recycled water treated to an advanced level suitable for augmentation to a drinking water source.

Residence Time: See "Detention Time."

Reverse Osmosis (RO): A common water filtration process that uses a semi-permeable membrane which allows water to pass through it, while removing contaminants.

RO: Reverse osmosis.

RWQCB: Regional Water Quality Control Board (State of California).

Secondary Treatment: Treatment following primary treatment. Removal of biodegradable organic matter and suspended solids from wastewater. Disinfection is usually the final stage of secondary treatment.

SBWRP: South Bay Water Reclamation Plant.

SDCWA-ESP: San Diego County Water Authority-Emergency Storage Project. See "Emergency Storage Project."

Soil-Aquifer Treatment: The process of water being purified by percolating through soil and into an underground aquifer.

Stakeholders: Individuals and organizations who are involved in or may be affected by a proposed action, such as construction and operation of a water recycling project.

Study: City of San Diego Water Reuse Study.

Supply Reliability: The reliability of the City's combined sources of supply of water under a variety of hydrologic and other conditions.

TDS: Total Dissolved Solids.

Tertiary Treatment: Treatment beyond secondary treatment typically involving the removal of residual particulate matter by granular media, surface, or membrane filtration.

Title 22 Treatment (Title 22): A method of tertiary wastewater treatment approved by DHS for many water reuse applications. Title 22, Chapter 4 of the California Code of Regulations, outlines the level of treatment required for allowable uses for recycled water, including irrigation, fire fighting, residential landscape watering, industrial uses, food crop production, construction activities, commercial laundries, road cleaning, recreational purposes, decorative fountains, and ponds.

Total Dissolved Solids (TDS): A measure of the amount of material dissolved in water (mostly inorganic salts). An important use of the measure involves the examination of the quality of drinking water. Usually expressed in milligrams per liter (mg/l).

UF: Ultrafiltration.

Ultrafiltration (UF): A membrane filtration process that falls between reverse osmosis (RO) and microfiltration (MF) in terms of the size of particles removed. UF removes particles in the 0.002 to 0.1 micron range, and typically removes large organic molecules, while allowing smaller molecules to pass.

Ultraviolet Treatment (UV): The use of ultraviolet light for disinfection.

UV: Ultraviolet treatment.

Water Authority: San Diego County Water Authority.

Water Reclamation: (1) The treatment of water of impaired quality, including brackish water and seawater, to produce a water of suitable quality for the intended use. (2) A term synonymous with *water recycling*.

Water Recycling: The process of treating wastewater for beneficial use, storing and distributing recycled water, and the actual use of recycled water.

Water Reuse: Synonymous with *water recycling*.

Wetland: An area periodically inundated by surface water or groundwater. Wetlands support plant and animal life, filter pollutants in stream courses, provide flood control and erosion prevention, and may provide recreational opportunities.

EQUIVALENCIES:

1 Hundred Cubic Feet (HCF) = .00230 Acre Feet (AF) = 748 gallons

1 AF = 435.6 HCF

1 AF = 43,560 cubic feet (cf)

1 AF = 325,851 gallons

1 cf = 7.48 gallons

1 million gallons per day (mgd) = 1,121 AF per year

1 AF is approximately the amount of water needed to serve two families of four for a year.

One family of four typically uses 18 HCF per month or 450 gallons per day.

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