County of McHenry – Division of Water Resources

Water Resources Action Plan

Glossary

Overview

This section includes definitions of key terms used throughout the Water Resource Action Plan.

Definitions

Agricultural Operations: Includes, but is not limited to: hobby farms, farmettes, nurseries, greenhouses, commercial operations, etc.

Agronomic (Merriam Webster's Dictionary): A term describing a branch of agriculture dealing with field-crop production and soil management.

Apparent losses (www.awwa.org): The paper losses that occur in utility operations due to customer meter inaccuracies, billing system data errors, and unauthorized consumption. In other words, water consumed but not properly measured, accounted, or paid for. These losses cost utilities revenue and distort data on customer consumption patterns.

Application efficiency: The ratio of the amount of water entering the soil to the amount of water withdrawn from the source.

Aquifer: Means saturated (with groundwater) soils and geologic materials, which are sufficiently permeable to readily yield economically useful quantities of water to wells, springs, or streams under ordinary hydraulic gradients. [35 IL Adm. Code 620.110]

Aquifer Recharge Area: Defined by its ability to infiltrate precipitation and runoff and effectively recharge underlying aquifers. A common characteristic of an effective recharge area is the presence of relatively permeable "granular" soils near the surface, underlain by sandy or gravelly deposits. While recharge areas effectively replenish aquifers, the county's more permeable soils also can lead to groundwater contamination. It is important to note that a very substantial part of McHenry County is underlain by areas that are categorized as having "high potential for aquifer contamination." (SARA map)

Base rate: Refers to the base price charged for a standard volume of water a household uses and the investment needed to treat and deliver that water (derived from aggregate estimates or individualized usage). The base rate is usually set during winter months when water usage is almost exclusively indoor use.

Baseline (Vickers): An established value or trend used for comparison when conditions are altered, as in the introduction of water-efficiency measures.

Benchmark (WCIP): Quantifiable metrics of efficiency. These measures can help determine progress toward a long-term goal. In cases where additional data are necessary, time-oriented activities are used to help determine progress toward a particular water conservation goal.

Beneficial water use (Vickers): The use of water to benefit people or nature.

Biological: A natural process, which uses microscopic plants and animals for the breakdown and removal of pollutants in the cleaning of a sanitary sewage flow.

Lowdown (AWE): Draining off the water in a cooling tower reservoir to avoid the buildup of excess dissolved solids. Also referred to as bleed-off.

BMPs plan: An operating document that can guide the GCS's management of water during periods of both adequate and insufficient supply. The BMPs can establish predetermined actions and water use responses in the event that water reductions are necessary.

Boilers (Merriam Webster's Dictionary): 1) a vessel used for boiling 2) the part of a steam generator in which water is converted into steam and which consists usually of metal shells and tubes 3) a tank in which water is heated or hot water is stored.

Class V injection well: This means injection wells not included in Class I, II, III, or IV. Class V wells include: (from Part 617 Regulated Recharge Areas, Subpart A, Section 617.102)

- Air conditioning return flow wells used to return to the supply aquifer the water used for heating or cooling in a heat pump;
- Cesspools, including multiple dwelling, community or regional cesspools, or other devices that receive wastes, which have an open bottom and sometimes have perforated sides. The Underground Injection Control (UIC) requirements do not apply to single family residential cesspools nor to non-residential cesspools that receive solely sanitary wastes and have the capacity to serve fewer than 20 persons a day;
- Single-pass, non-cooling, non-contact cooling water return flow wells used to inject water previously used for cooling;
- Drainage wells used to drain surface fluid, primarily storm runoff, into a subsurface formation;
- Dry wells used for the injection of wastes into a subsurface formation;
- Recharge wells used to replenish water in an aquifer;
- Sand backfill and other backfill wells used to inject a mixture of water and sand, mill tailings, or other solids into mined out portions of subsurface mines whether or not what is injected is a radioactive waste;

- Septic system wells used to inject the waste or effluent from a multiple dwelling, business establishment, community, or regional business establishment septic tank. The UIC requirements do not apply to single family residential septic system wells that are used solely for the disposal of sanitary waste and have the capacity to serve fewer than 20 persons a day (Conflicts with Conservation Design);
- Subsidence control wells (not used for the purpose of oil or natural gas production) used to inject fluids into a non-oil or gas producing zone to reduce or eliminate subsidence associated with the overdraft of fresh water;
- Radioactive waste disposal wells other than Class IV;
- Injection wells associated with the recovery of geothermal energy for heating, aquaculture, and production of electric power;
- Wells used for solution mining of conventional mines such as stope leaching;
- Wells used to inject spent brine into the same formation from which it was withdrawn after extraction of halogens or their salts;
- Injection wells used in experimental technologies;
- Injection wells used for in-situ recovery of lignite, coal, tar sands, and oil shale (40 CFR 146.5).

Commercial user (AWE): Customers who use water at a place of business, such as hotels, restaurants, office buildings, commercial businesses, or other places of commerce. These do not include multifamily residences, agricultural users, or customers that fall within the industrial or institutional classifications.

Conservation tillage: A method of improving the soil so that rain can infiltrate and be retained. Residues left from properly managed winter cover or grain crops, and to some extent the prior crop, improve water intake from both rain and irrigation.

Conservation-oriented rate structure (SWP): A rate structure adopted by a water utility or water provider that is designed to reflect the cost of providing water and encourage efficient use of water by customers. (AWE) A pricing structure billed by the quantity of commodity delivered and tied to the costs associated with that delivery, designed to provide an accurate price signal to the consumer.

Consumptive use (SWP): The difference between the total amount of water withdrawn from a defined hydrologic system of surface water or groundwater and the total amount of the withdrawn water that is returned to that same hydrologic system over a specified period of time.

Cooling degree days: Quantitative indices designed to reflect the demand for energy needed to cool a home or business.

Cooling towers (AWE): A mechanical device that cools a circulating stream of water by evaporating a portion of it. A cooling tower is part of a system that provides air conditioning or equipment cooling. It usually includes a heat exchanger, re-circulating water system, fans, drains, and makeup water supply.

Cost-benefit analysis (EPA): A comparison of total benefits to total costs, usually expressed in monetary terms, used to measure efficiency and evaluate alternatives.

Cost-effectiveness (EPA): A comparison of costs required for achieving the same benefit by different means. Costs are usually expressed in dollars, but benefits can be expressed in another unit (such as quantity of water).

Counter-flow: Cooling or rinsing – where water needed for cooling or cleaning of a product is introduced counter to the flow of the product, such that the product enters the basin near the water exit, where the water is the dirtiest/warmest, and product exits the basin near the water entrance, where the product contacts the cleanest/coolest water before leaving the process.

Counter-flow equipment: Equipment required to facilitate or initiate counter-flow rinsing within a process. Such equipment usually consists of an elongated basin that provides some residence time for the product to contact the water, and a means to provide clean water at one end, and discharge dirty or hot water at the opposite end.

Cropping systems: A term used to describe a specific crop or crop rotation and the associated cultural and mechanical practices used to grow that crop. For example conventionally tilled cotton and conservation-tilled cotton describe two different cropping systems with the same crop.

Culture of conservation: A culture of citizens encourages individuals to more fully appreciate our natural resources and actively participate in their protection. McHenry County's culture of conservation should strengthen our individual and collective commitments to water conservation as an effective way to sustain precious water resources for current and future generations.

Customer class (AWE): A group of customers (residential, commercial, industrial, wholesale, and so on) defined by similar characteristics or patterns of water usage.

Declining block rate (AWE): A commodity rate whose unit price decreases with increasing water use.

Demand management (AWE): Measures, practices, or incentives deployed to change the pattern of demand for a service by its customers/users within a particular sector or slow the rate of growth for that service.

Disinfection: The process of destroying pathogenic or disease causing organisms.

Dollar value-added: Generally defined as the difference between sales revenue and the costs of raw materials and utilities

Domestic water use (Vickers adjusted): Water used by sanitary plumbing fixtures (toilets, urinals, faucets, and showerheads) and appliances (clothes washers and dishwashers) in nonresidential settings such as industrial, commercial, and institutional properties and water used for residential purposes such as drinking, food preparation, bathing, washing clothes and dishes, and flushing toilets.

Drought (Vickers): An extended period of below-normal precipitation that can result in water supply shortages, increased water demand, or both.

Efficient (Vickers): (1) performing or producing effectively with a minimum of waste, expense or unnecessary effort; competent (2) satisfactory and economical use.

Efficient water use (SWP): Considered the minimal amount of water that is technically and economically feasible to achieve an intended water use function. Efficient water use reduces water waste.

Effluent: A term referring to water flow as the flow exits a facility, structure, or process.

End user (Vickers): Consumer of water (e.g. residential, commercial, industrial, or agricultural water customer).

Evapotranspiration (AWE): The quantity of water evaporated from soil surfaces and transpired by plants during a specific time.

Flue gas scrubbing: Also known as flue gas desulfurization, can be accomplished with either dry or wet systems. Wet scrubbers entrain flue gas in water spray, capturing sulfur dioxide and other pollutants, which are then removed by creating an alkaline slurry. Dry scrubbing injects the alkaline particles directly into the flue gas stream, using a smaller amount of water, but the more limited contact between reactants in the absence of water results in lower pollutant removal efficiencies. (Note: Most “dry” scrubbers are not really dry in that they involve the use of water in the lime injection system; that water evaporates in the scrubber. The water use is less than that of “wet” scrubbers but it is not zero.)

Groundwater Recharge: For the purpose of this policy, the term recharge refers to the infiltration of water into soil such that it has the potential to recharge an aquifer. It does not reference the recharge of any one specific aquifer. More specifically, recharge is the process by which precipitation reaches and re-supplies the groundwater. Areas that have conditions that favor rapid recharge are the main areas where the groundwater is replenished. Groundwater can be extracted from anywhere, but can only be re-supplied (naturally or artificially) through recharge areas. Therefore, recharge areas provide a fast conduit to re-supply groundwater and counter the effects of human consumptions. On the other hand, the characteristics that encourage rapid refreshment of the groundwater are the same characteristics that favor the travel of contaminants from the surface to the groundwater and which can degrade the groundwater supply. Activities that use materials that might generate contaminants when released to the ground have the potential to cause these contaminants to migrate rapidly to groundwater.

Hazardous materials: Materials that are monitored and documented of their usage by the Federal Environmental Protection Agency (EPA) and the Illinois Environmental Protection Agency (IEPA).

High efficiency toilet (AWE): A fixture that flushes at 20 percent below the 1.6 gallons per flush maximum or less, equating to a maximum of 1.28 gpf.

Household Hazardous Waste: Household chemicals, such as cleaning agents, paints, solvents, disinfectants, pesticides, and automotive production that presents a serious threat to wastewater, groundwater, and surface water when used or disposed of improperly.

Implementation actions (WCIP): Actions, such as providing financial assistance or developing technical guidance, that when resources are available can be taken by state agencies, associations, organizations, and other groups to support the implementation of practices.

Inclining block rate (AWE): A commodity rate whose unit price increases with increasing water use.

Individualized rate: Also known as budget-based rates, are a version of inclining block rates in which the blocks or tiers are determined for each customer by the customer's usage history, and are usually set based upon the quantity of occupants and the square footage of landscape.

Influent: A term referring to water flows as the flow enters a facility, structure, or process.

Irrigation audit: Concerning agricultural irrigation, an irrigation audit is considered a procedure to collect and present information concerning the uniformity of application, precipitation rate, and general condition of an irrigation system and its components. Also see "Water audit."

Large Water User: A user that extracts 100,000 gallons or more per 24 hour period.

Management practices (SWP): Reasonable methods, considering available technology and economic factors, for managing water demand, water supply, return of water to water sources, and prevention and control of pollution of the waters of the state.

Marginal cost (Chesnutt, et al 1997): Also known at incremental costs reflect an estimate of the cost of developing the next increment of supply needed to satisfy an increase in water usage. Marginal cost analysis can be used to estimate the savings (or avoided cost) from not developing new supply sources to meet additional usage. Marginal cost pricing recognizes that future costs may be very different than historical costs.

Medication Disposal Program: A program designed to eliminate the intentional and unintentional misuse of medications, facilitated by police departments in partnership with the Illinois Environmental Protection Agency and McHenry County Water Resources.

Microorganisms: Microscopic plants and animals too small to be seen without the aid of a microscope.

NAICS (formally SIC codes): North American Industry Classification System. A consolidation of the codes for the U.S., Canada, and Mexico. Produced by the U.S. Office of Management and Budget.

New: For the purpose of this policy, "new" means the following:

- A facility site or unit that is not in existence or for which construction has not commenced at its location as of the effective date of this policy;
- A facility, site, or unit that expands laterally beyond the currently permitted boundary or, if the potential primary sources in not permitted, the boundary in existence as of the effective date of any part of this policy;
- A unit or site that is part of a facility that undergoes major reconstruction, which shall be deemed to have taken place where the fixed capital cost of the new components, constructed within a 2-year period, exceed 50% of the fixed capital cost of a comparable entirely new facility; or
- A Class V injection well that is not in existence or for which construction has not commenced at its location as of the effective date of any part of this policy that creates a delineated recharge area in which that facility is located.

Non-contact cooling water: Water used to reduce temperature that does not come into contact with any raw material, intermediate product, waste product (other than heat), or finished product. Non-contact cooling water does not include any process waters or other type of wastewaters, nor is it exposed to anything but the inside of the pipe.

Non-industrial water use: Water used to support activities within industrial and commercial facilities that are not related to cooling, heating, and processing.

Nonpotable water (AWE): Water that does not, or may not, meet drinking water quality standards.

Nonrevenue water (AWE): For water providers, (1) the volume of unbilled authorized consumption (water for fire fighting, system flushing and similar uses) added to real losses and apparent losses; or (2) the difference between system input volume and billed authorized consumption.

Overall gpcd: Volume of water used per capita per day. In the WCIP, overall water use estimates are calculated by dividing the total volume of water withdrawn by public water provider(s) by the population served by public water supply.

Pavement: Includes all county, township, municipal, state, and private roadways, sidewalks, parking lots, driveways, and any other salted surface.

Peak water demand or use (AWE): The maximum demand occurring in a given period, such as hourly, daily or annually.

Performance-based contracting (www.gsa.gov): Also known as performance-based acquisition, a technique for structuring all aspects of an acquisition around the purpose and outcome desired as opposed to the process by which the work is to be performed.

Personal Pollution Prevention (P3): Refers to the proper management and disposal of necessary consumer products that in small quantities can produce significant contamination to ground and surface waters.

Potable Water: Water intended for the uses of drinking, cooking, or washing of one's face or hands. Potable is clean and safe for human consumption and is often referred to as the public water supply.

Real losses (www.awwa.org): The physical losses of water from the distribution system, including leakage and storage overflows. These losses inflate the water provider's production costs and stress water resources since they represent water that is extracted and treated, yet never reaches beneficial use.

Reclaimed Water : Refers to effluent receiving advanced treatment; another term for recycled water.

Recycled water (AWE): A term used to describe reclaimed water.

Residential gpcd: Volume of water used per capita per day for residential purposes only.

Retrofit (AWE): (1) Replacement of existing water using fixtures or appliances with new and more efficient ones. (2) Replacement of parts for a fixture or appliance to make the device more efficient.

Reuse (SWP): The use of reclaimed water as a substitute for another generally higher quality water source. Reclaimed water can be reused for the beneficial irrigation of areas that may be accessible to the public (such as golf courses, residential and commercial landscaping, parks, athletic fields, roadway medians, and landscapes) and for other beneficial uses such as human uses, cooling towers, concrete mixing, and car washes.

SARA Title III: Establishes requirements for federal, state, and local governments, Indian Tribes, and industry regarding emergency planning and "Community Right-to-Know" reporting on hazardous and toxic chemicals.

Sensitive Aquifer Recharge Areas (SARAs) Map: SARAs in McHenry County are defined as the geographic areas where there is the highest infiltration (or recharge) potential.

SIC Code (AWE): A system devised by the federal government to classify industries by their major type of economic activity. The code may extend from two to eight digits. This term has been superseded by the NAICS.

Sub-metering (AWE): The practice of using meters to measure master-metered utility consumption by individual users. Including:

> Total-capture sub-metering, which is a type of sub-metering where all of the actual water consumption in each unit is measured
>
> Partial-capture sub-metering, which is a type of sub-metering where only a portion of the total water consumption in each unit is measured

Supply-side management (AWE): Increasing water supply by developing more raw water, generally building reservoirs and canals or drilling groundwater wells.

Tier 1 Industry and Tier 2 Industry: As defined by the Wisconsin Administrative Code, Chapter NR 216, STORM WATER DISCHARGE PERMITS, pages 9-10.

Travelers: Agricultural irrigation systems which pumps water from a sources and through a flexible hose or permanent buried plastic pipe could connect the pump to a number of different staging locations in the field.

Turf grass (AWE): Hybridized grasses that, when regularly mowed, form a dense growth of leaf blades and roots.

Ultra Low Flush Toilet (AWE): A toilet that flushes with 1.6 gallons or less.

Unaccounted for water (EPD rules and regulations): (1) the difference between the total amount of water pumped into the system from the source(s) and the amount of metered water use by the customers of the water system expressed as a percentage of the total water pumped into the system. UAW generally includes system leakage and unmetered uses such as fire fighting, flushing, broken water mains, etc. (2) (Vickers) water that does not go through meters (e.g., water lost from leaks or theft) and thus cannot be accounted for by the utility.

Uniform block rate (AWE): A commodity rate that does not vary with the amount of water use.

Urban agriculture (www.urbanagcouncil.com) – the creation, growth, introduction and management of constructed landscapes designed to support and enhance natural environmental systems and a sustainable quality of life through mitigation of land altering activity

Water audit (AWE): (1) An onsite survey of an irrigation system or other water use setting to measure hardware and management efficiency and generate recommendations to improve its efficiency. (2) For water distribution systems, a thorough examination of the accuracy of water agency records and system control equipment to identify, quantify, and verify water and revenue losses.

Water budget based rates (AWE): Also known as individualized rates, a version of inclining block rates in which the blocks or tiers are determined for each customer by the customer's usage history, and are usually set based upon the quantity of occupants and the square footage of landscape.

Water conservation (SWP and Vickers): The beneficial reduction of water use, water waste, and water loss.

Water conservation goal (WCIP): Sector-specific, long-term aspirations for water use and efficiency. The goals are not one-size-fits-all targets for reductions in water use; they are designed to be flexible, so that they are applicable for users with differing circumstances and recognize prior investments in conservation.

Water conservation practice (Vickers): Activities to be implemented by water users and/or water or electric providers to reach benchmarks and goal(s).

Water-dependent natural areas or water-dependent ecosystems: Include wetlands, some of them associated with rivers, streams, and fens, a special class of "wet" lands reliant on specific water flow rates, temperature, and ph.

Water loss: Water that does not make it to the point of intended use. This is generally in the form of leaks, but could take other forms such as the routing of spring water directly to a stormwater drain or a treatment system. Concerning agricultural irrigation, water loss is considered water lost to leaks in the system or that is not accounted for out the end of the system. Where ponds are used to temporarily store pumped ground water for later use, losses can include evaporation or seepage losses from the pond.

Water management practice (SWP): Reasonable methods, considering available technology and economic factors, for managing water demand, water supply, return of water to water sources, and prevention and control of pollution of the waters of the state.

Water resources in McHenry County include groundwater found in shallow and deep aquifers and surface waters (lakes, rivers & streams).

Water recycling: Within an IC facility or process, the use of water that has already been used at least once as a substitute for fresh water supply to that facility.

Water use (SWP and Vickers): The utilization of water for natural and human uses. In a restrictive sense, water that is actually used for a specific purpose (end use) or by a particular group, such as residential, industrial or agricultural users. Concerning agricultural irrigation, water use is considered the total amount of groundwater or surface water pumped by the irrigation system.

Water use efficiency (SWP and AWE): (1) generally addresses how efficiently water is used or the acct of achieving a water use function with the minimal amount of water that is technically and economically feasible (2) a measure of the amount of water used versus the minimum amount required to perform a specific task.

Water use intensity: A measure of how efficiently water is used in industrial, commercial and business operations. It can be calculated as a ratio between total water use or consumption and a unit of product, function, or service delivered by an industrial, commercial, or agency.

Water use profile (AWE): A quantitative description (often displayed graphically) of the different water uses at a residence, business site, or utility service area.

Water waste: A volume of water that meets an intended use, but may not be considered efficient concerning agricultural irrigation, water waste is considered water not used by the plants or animals being produced, including (1) water that directly evaporates from ponds, (2) water that directly evaporates from soaked soils or leaches past the root zone, and (3) water that is applied to non-target areas.