

A Primer on Representing Municipal Water and Wastewater Utilities

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How Does This Happen?





Maybe Magic?



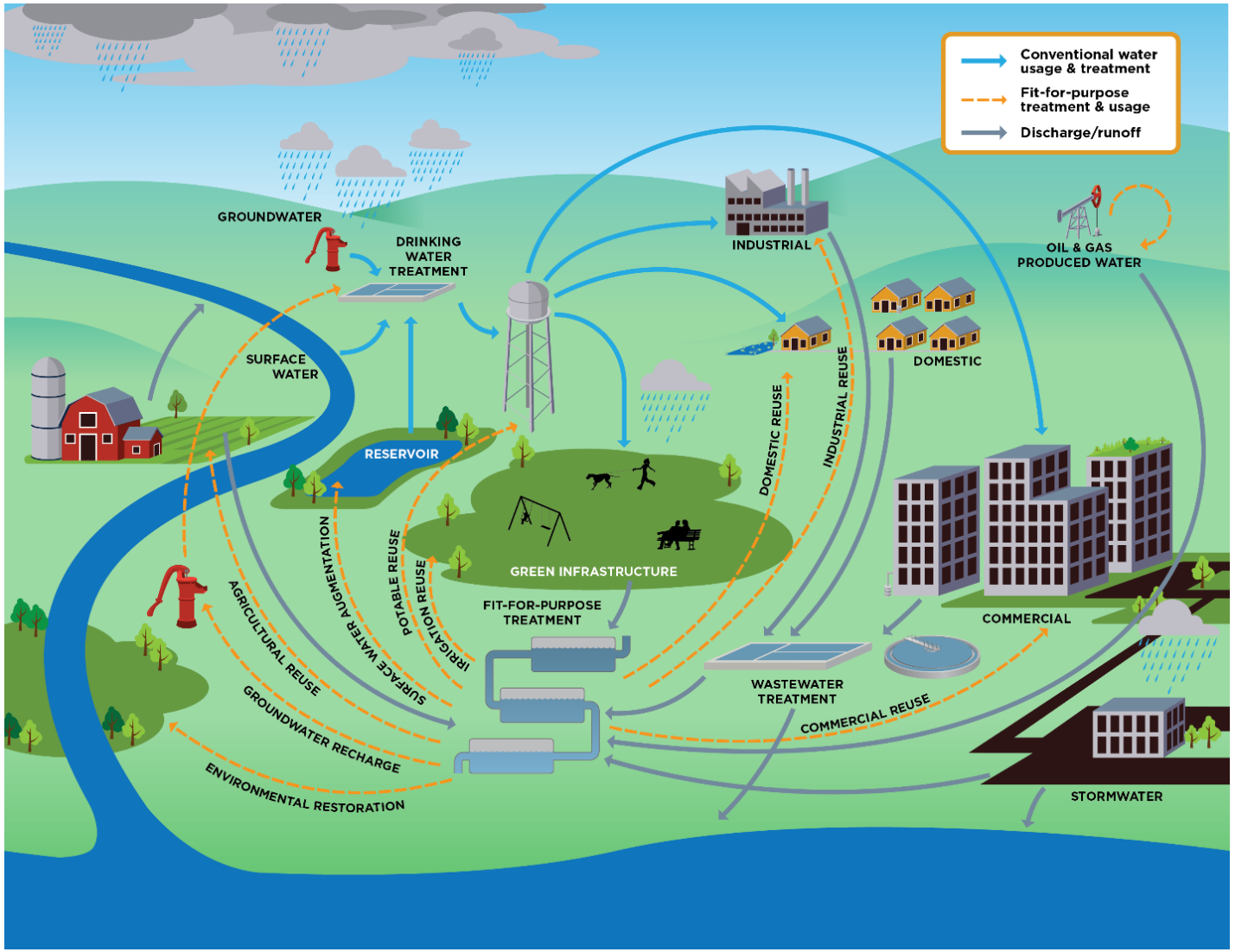


Is this going to be you?



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Circular Nature of Water and Wastewater Treatment Systems



Source: https://www.epa.gov/waterreuse/basic-information-about-water-reuse

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Municipal Authority for Operating Water Utilities

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Dillon’s Rule Cities (Non-Home Rule)

Dillon’s Rule Municipalities – generally those that only have powers expressly granted by the state legislature. **Examples:**

- **Texas**: "A municipality may purchase, construct, or operate a utility system inside or outside the municipal boundaries and may regulate the system in a manner that protects the interests of the municipality. The municipality may own land inside or outside its boundaries for these purposes." **Tex. Loc. Gov't Code Ann. § 552.001**
- **Florida**: “Any municipality or private company organized for the purposes contained in this chapter, is authorized:

  …

  (3) To provide water and alternative water supplies, including, but not limited to, reclaimed water, and water from aquifer storage and recovery and desalination systems for domestic, municipal or industrial uses;

  (4) To provide for the collection and disposal of sewage, including wastewater reuse, and other liquid wastes;

  (5) To provide for the collection and disposal of garbage;

  (6) And incidental to such purposes and to enable the accomplishment of the same, to construct reservoirs, sewerage systems, trunk sewers, intercepting sewers, pumping stations, wells, siphons, intakes, pipelines, distribution systems, purification works, collection systems, treatment and disposal works;” **Fla. Stat. Ann. § 180.06**

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Home Rule Jurisdictions

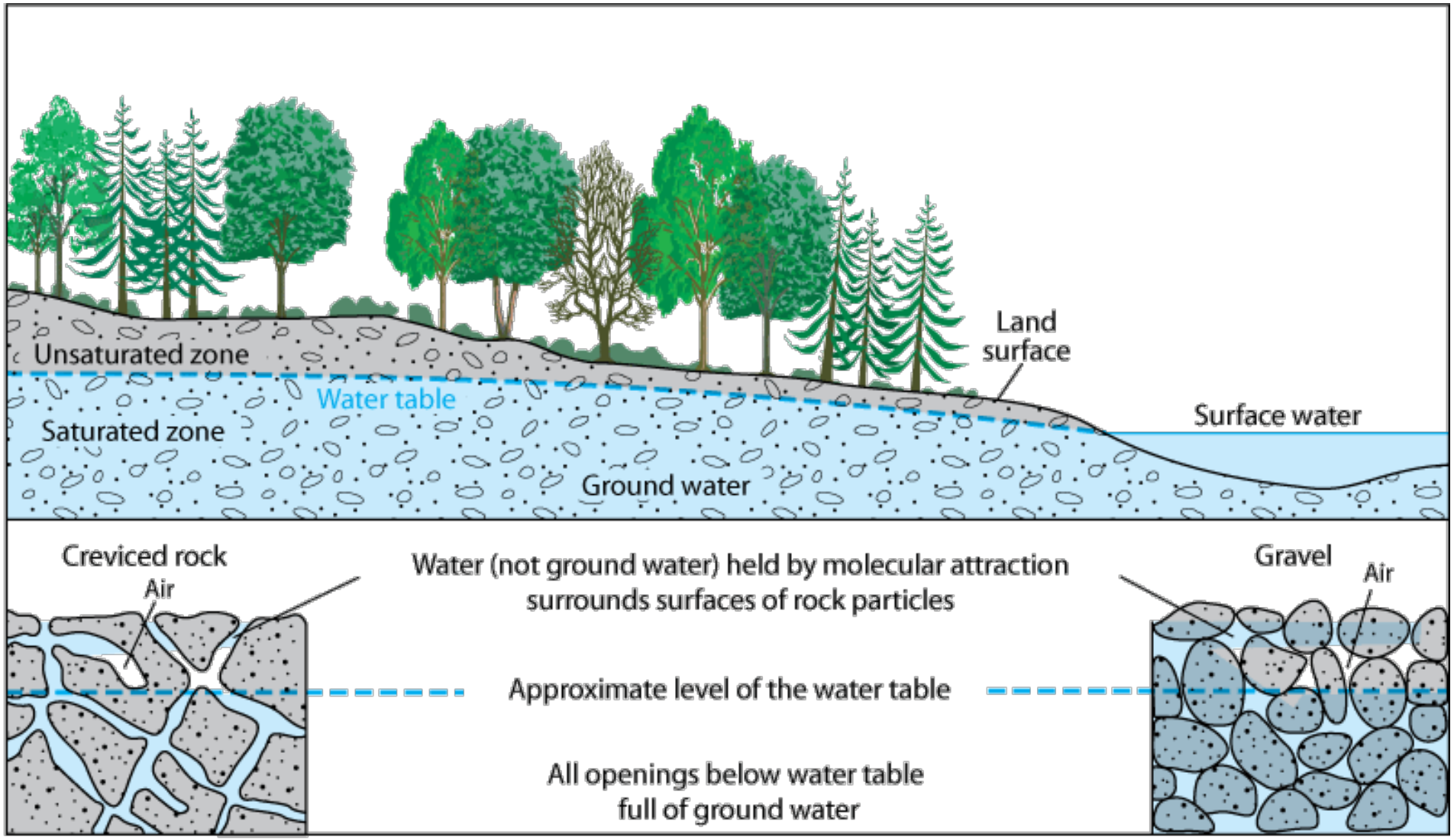
- Water utility authority typically authorized directly by local charter and code of ordinances. Home rule authorizes a local government to act in any way not inconsistent with the state constitution, state law, or the charter. Courts generally presume a home rule jurisdiction is authorized to act unless the act is specifically prohibited by state law or charter.
- Home rule cities generally look to the legislature not for grants of power, but for limitations on their power.

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Potable Water Service



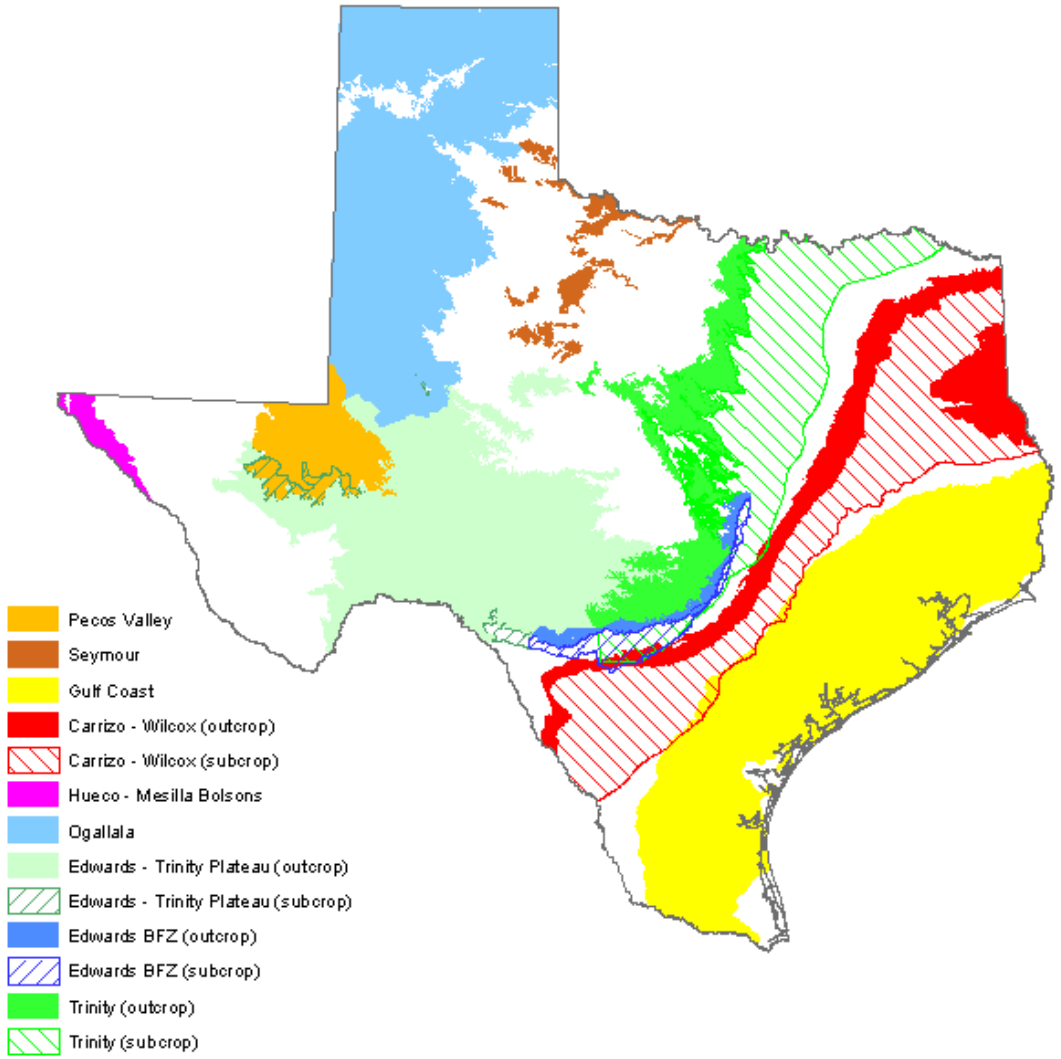
Sourcing of Potable Water



Source: https://www.usgs.gov/media/images/groundwater-saturated-zone-soilrock-below-land-surface

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Groundwater Pumped from Aquifer



Source: https://www.twdb.texas.gov/groundwater/aquifer/major.asp

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Surface Water Sourcing



Source: https://www.tceq.texas.gov/permitting/water_rights

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Potable Water Treatment Process

- The US Environmental Protection Agency (EPA) establishes minimum standards to ensure that public water systems provide safe drinking water under the Federal Safe Drinking Water Act (42 U.S.C. §§ 300f to 300j-27).
- In most states, a state environmental agency implements and enforces these rules on behalf of the EPA.

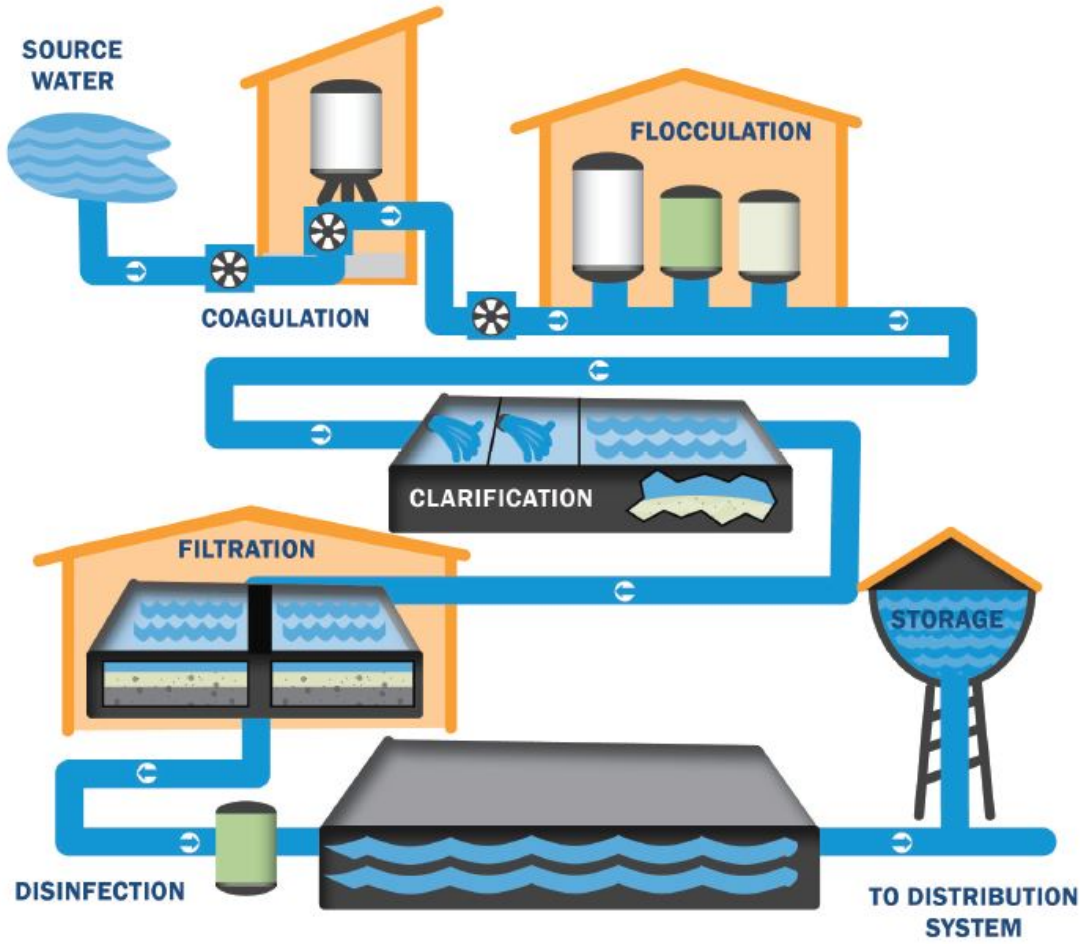
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Potable Water Treatment Process

- **Coagulation and flocculation**
- **Sedimentation**
- **Filtration**
- **Disinfection**
- **Fluoridation**

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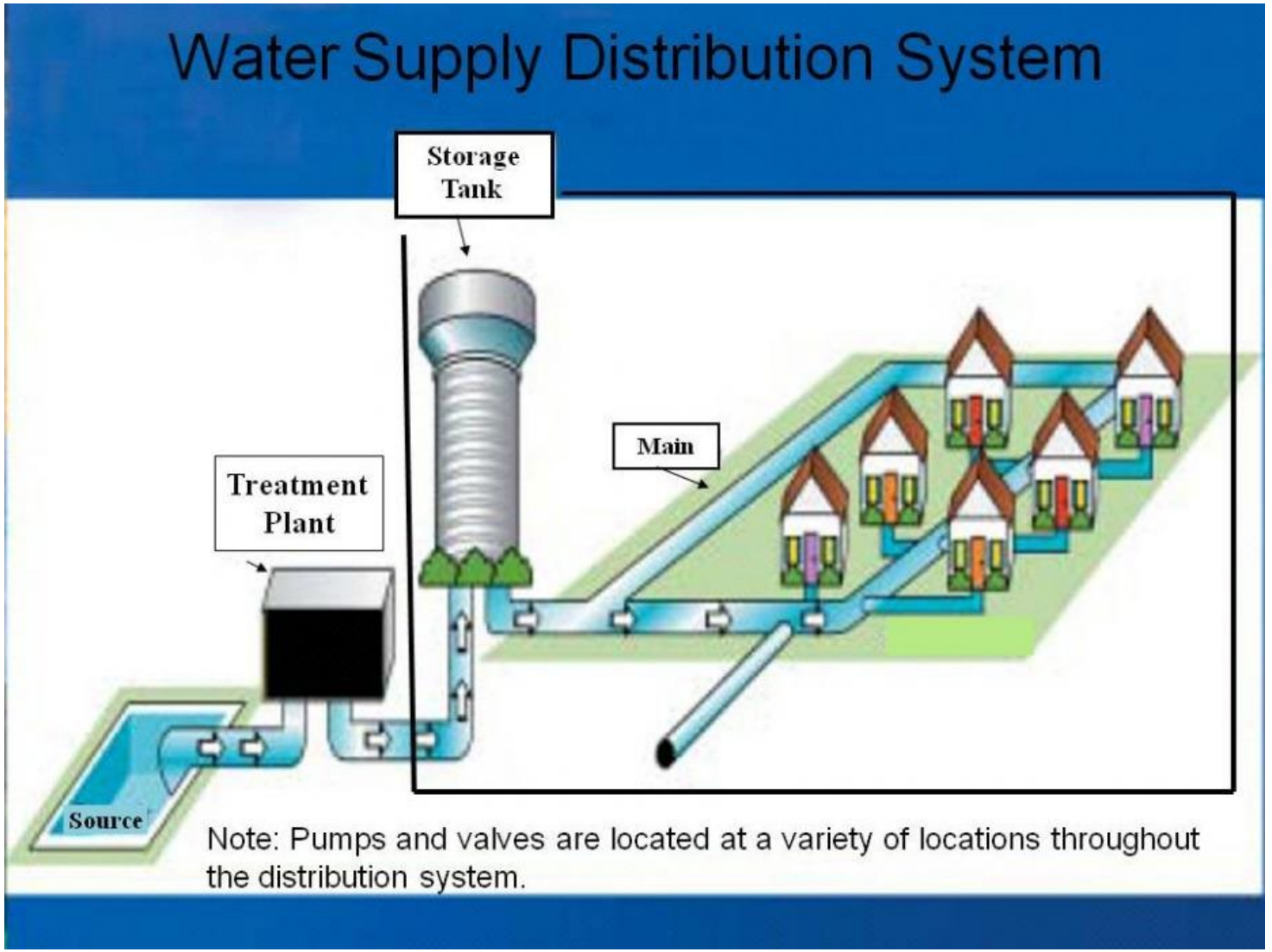
Potable Water Treatment Process



Source: US Environmental Protection Agency (EPA): http://www.epa.gov/ogwdw/kids/watertreatmentplant/index.html

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Potable Water Distribution



Source: https://www.epa.gov/dwsixyearreview/drinking-water-distribution-systems

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Measuring Water Pressure

- Water pressure is measured in **pounds per square inch or PSI**.
- Water pressure for residential structures is typically between 45-80 PSI, while commercial developments may require 75-100 PSI.
- Many local governments require a minimum water pressure to ensure that fire prevention systems, such as fire hydrants, work properly.

Wastewater Service

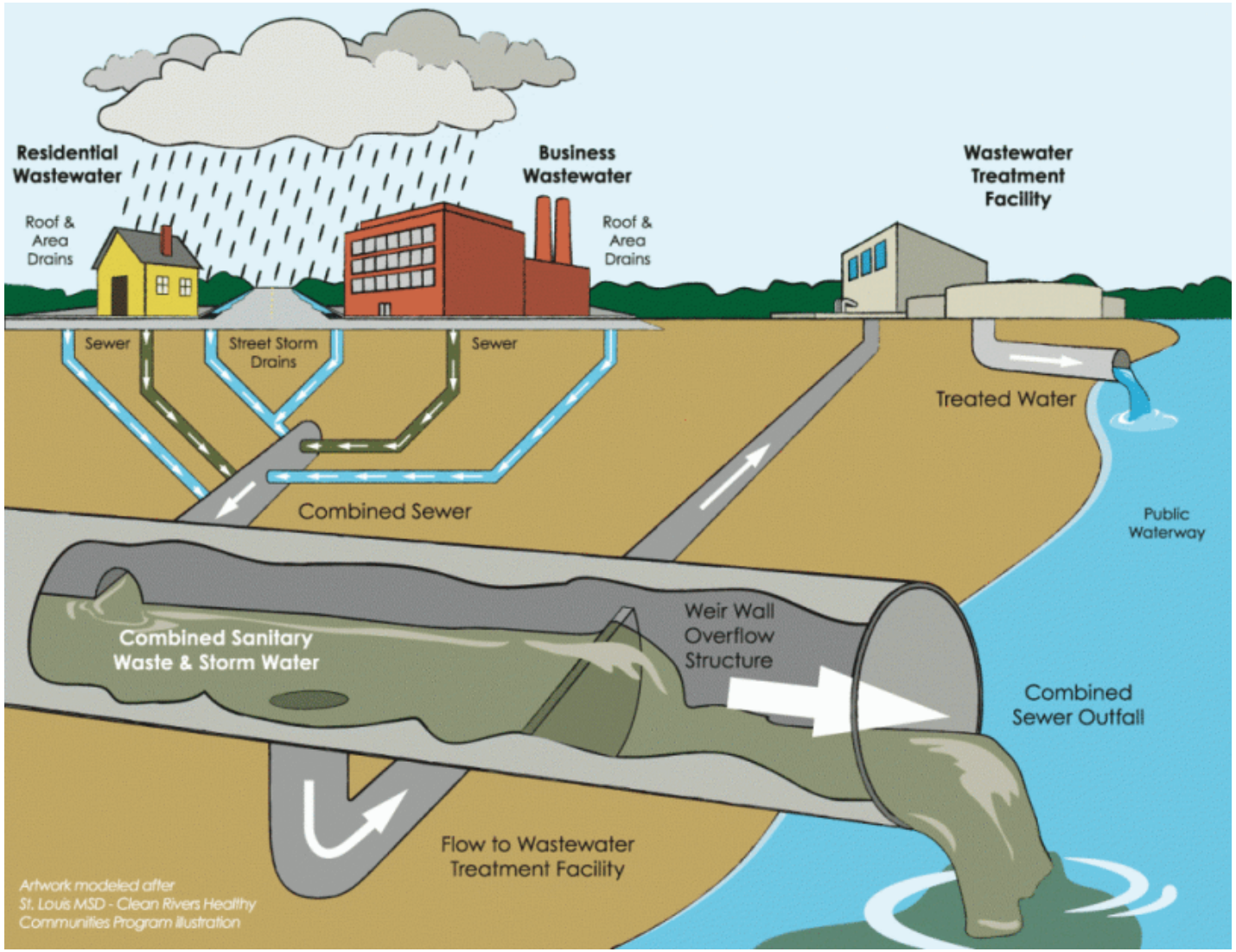


Source: https://www.epa.ohio.gov/dsw/permits/GP_WaterTreatmentPlants

Defining Wastewater

- In the municipal context, wastewater often means the used water that is flushed down a toilet or that drains from a sink, tub, or household appliance and ultimately flows into the municipal sewerage system for treatment.
- This water is now considered non-potable and is collectively referred to as wastewater, sewage, or influent.
- After the wastewater is treated, it is referred to as effluent and is discharged from the treatment system.
- Municipal sewer systems do not accept wastewater directly from industrial users to prevent toxic and chemical waste from draining into the system. These pollutants can interfere with the utility's ability to later use or dispose of sludge, and some industrial pollutants would pass through the process untreated. To allow the acceptance of industrial wastewater into the municipal wastewater system, the local government must create a local pretreatment program.

Wastewater Collection Systems



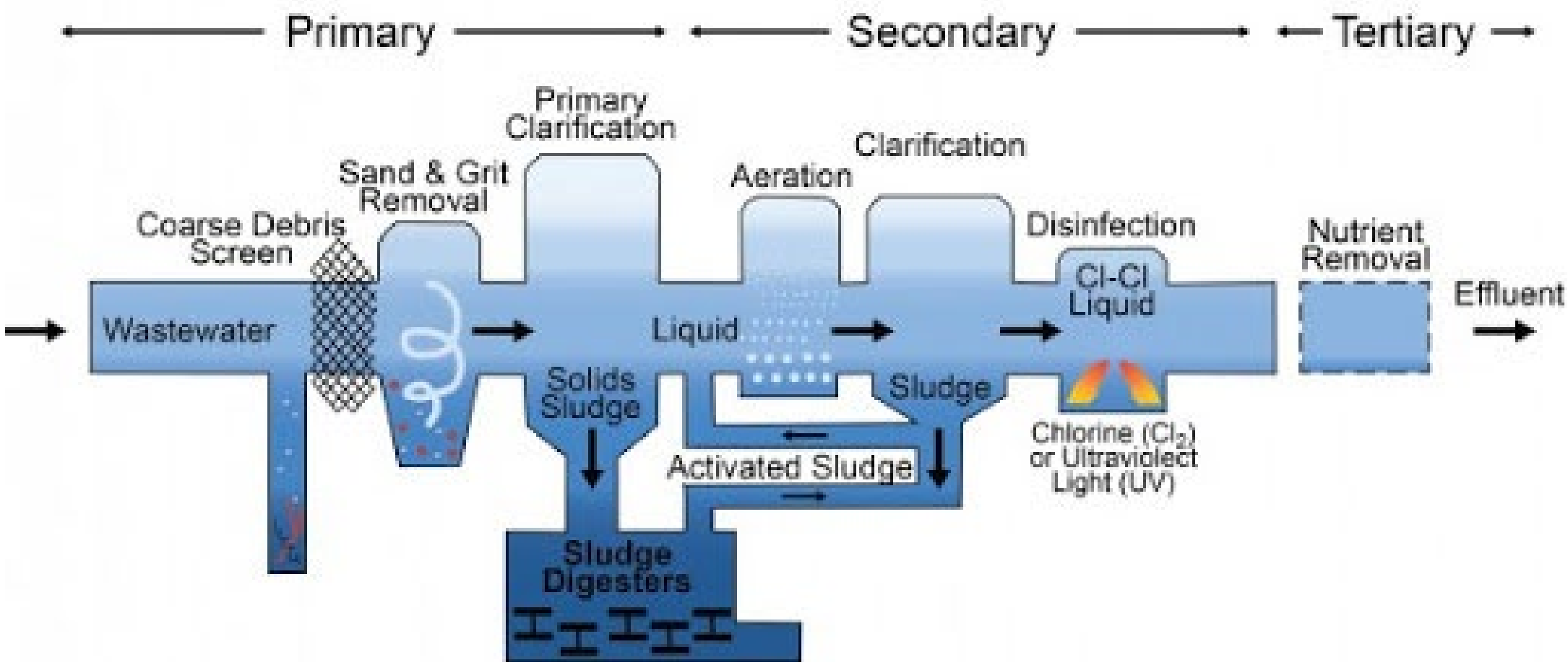
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Wastewater Treatment Process

- **Primary Treatment**
  - **The headworks**
  - **Grit chambers**
  - **Sedimentation tanks**
- **Secondary Treatment**
  - **Trickling filters**
  - **Activated sludge**
- **Disinfection and Effluent Discharge**

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Wastewater Treatment Process



Source: http://css.umich.edu/factsheets/us-wastewater-treatment-factsheet

Effluent Discharge



Effluent Discharge

- Effluent is discharged to receiving waters, such as the ocean, lakes, and rivers.
- The EPA regulates the discharge of effluent under the Clean Water Act and the National Pollutant Discharge Elimination System (NPDES).
- The EPA has delegated the NPDES permitting authority to state environmental agencies in most states. These agencies have assumed authority to administer the NPDES program through their local program.
- State law dictates whether effluent can be applied to land.

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Biosolid Fertilizer and Reclaimed Water



Source: https://www.usgs.gov/special-topic/water-science-school/science/reclaimed-wastewater?qt-science_center_objects=0#qt-science_center_objects

Utility Metering and Billing

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Utility Metering

- Water utilities use meters to gauge the customer's consumption of potable water. The meters measure the flow of water to the customer and typically calculate usage in terms of either:
  - Gallons. Water utilities tracking consumption by the gallon often describe water usage on a bill in terms of 1,000-gallon units of measurement (often a certain charge per thousand).
  - Cubic feet. This measurement is described in terms of centum cubic feet (CCF), where one CCF equals 748 gallons of water. Some utilities use the acronym HCF (for hundred cubic feet) instead of CCF, though both mean the same thing.
- The sewer lines are not typically metered. The sewer usage instead is estimated based on the amount of potable water used.

Utility Billing

- A typical customer's monthly bill includes:
  - A base rate charge to cover the costs incurred by the utility to operate and maintain the system.
  - A charge for the consumption of potable water (calculated by multiplying the service rate times the amount of water used). Many local governments use a tiered system that applies different billing rates to different tiers of water use or classes of service. For example, the utility could charge one rate for the first 1,000 gallons used and a higher rate for water consumption over the first 1,000 gallons used.
  - A charge for sewer services that is based on the consumption of potable water. For example, the utility may base the sewer bill on potable water usage during the winter as more water is typically used outside for sprinklers and gardens in the summer months.
- Municipal utilities also commonly require the payment of one-time charges, including:
  - Deposits to secure the customer's future payments.
  - Tap fees that cover the cost of connecting to the system, such as installing the meter and service line.
  - Capital charges that represent the customer's fair share of the construction costs for the system.

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Common Sources of Liability

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Potential Municipal Liability

- Potential claims against municipal utilities include those based on:
  - Failure to comply with federal and state law or the conditions of a permit required to operate the utility.
  - Potable water quality.
  - Flooding caused by negligently maintained water and sewer lines.
  - Billing disputes and termination of or refusal to provide utility services.
  - Real property and property access disputes.