

How Water Works

ILLUSTRATED PROCESSES, EQUIPMENT, AND TECHNOLOGY

Direct Filtration Offers an Inexpensive Solution to Conventional Treatment

Water treatment plants using direct filtration don't have a flocculation and sedimentation step, unlike a conventional treatment process. Direct filtration is generally used to treat raw water with low levels of suspended matter—average turbidities below 25 ntu and color below 25 units. The major advantage of direct filtration is its lower construction cost compared with that of conventional plants. However, because of the short time span between coagulant addition and filtration, and the greater load applied to the filters, this type of system must be carefully monitored to avoid turbidity breakthrough into the finished water.

1. Water from reservoirs (1a), wells (1b), and other sources need to meet high-quality standards for direct filtration plants.
2. Chemical coagulants are added to react with small particles in the water to form particles large enough to filter out. Rapid mixing distributes the coagulant evenly throughout the water.
3. Flocculation basins (3a) and sedimentation basins (3b) are eliminated from the process, thereby significantly reducing the plant's footprint.
4. Filtration removes any remaining particles. Dual-media, multimedia, or deep-bed monomedium filters should always be used for direct filtration because they can remove more suspended solids before backwashing is needed than sand-only filters.
5. Chlorine is added for disinfection. A chlorinator meters chlorine gas from a chlorine cylinder or other container and then delivers the set dosage.
6. Finished water basins ensure contact time is allotted for adequate disinfection.
7. A clearwell stores water before the water enters the distribution system.
8. Pumps send clean, safe water throughout the community.

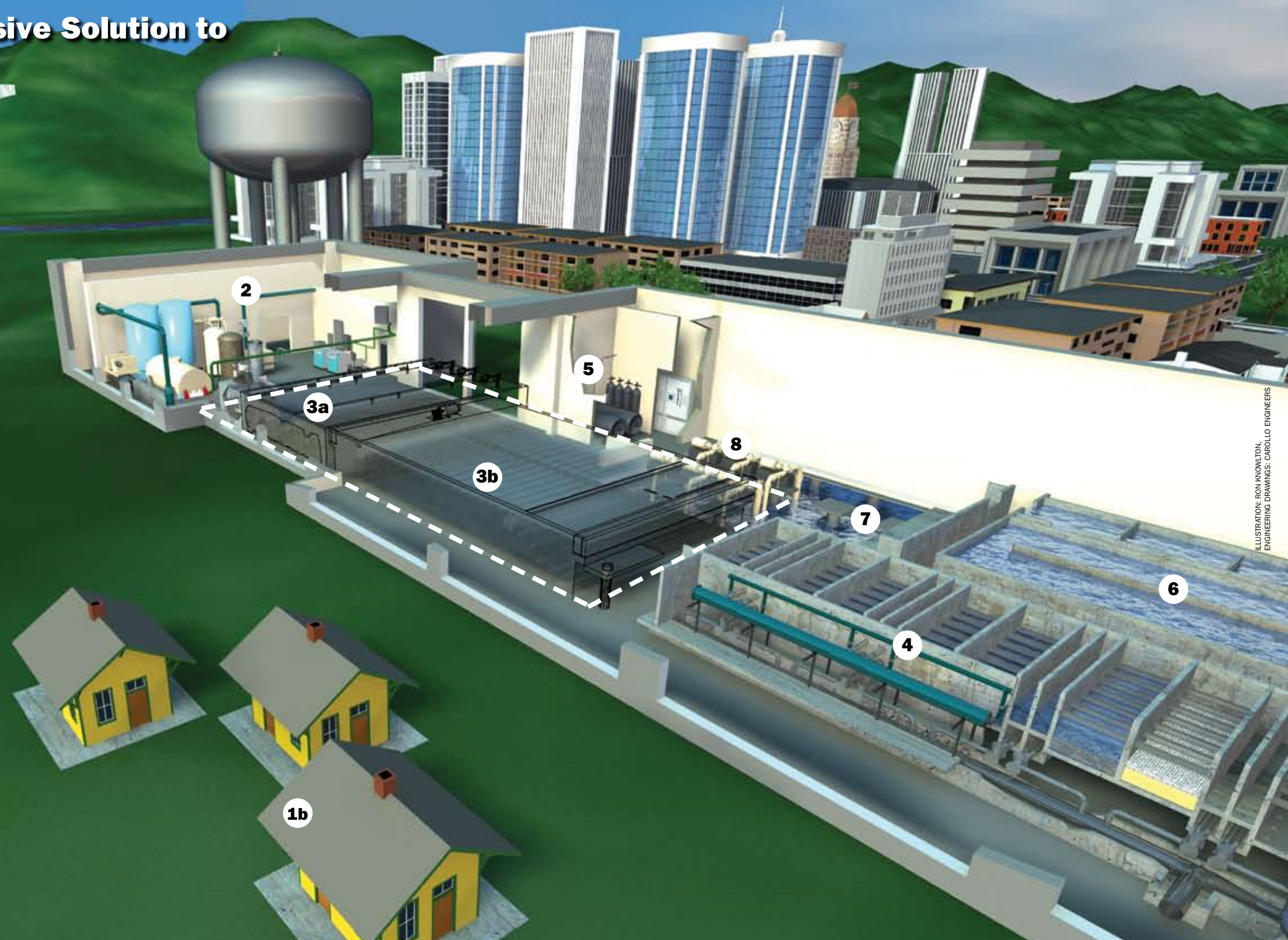


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Some illustration elements exaggerated for emphasis.