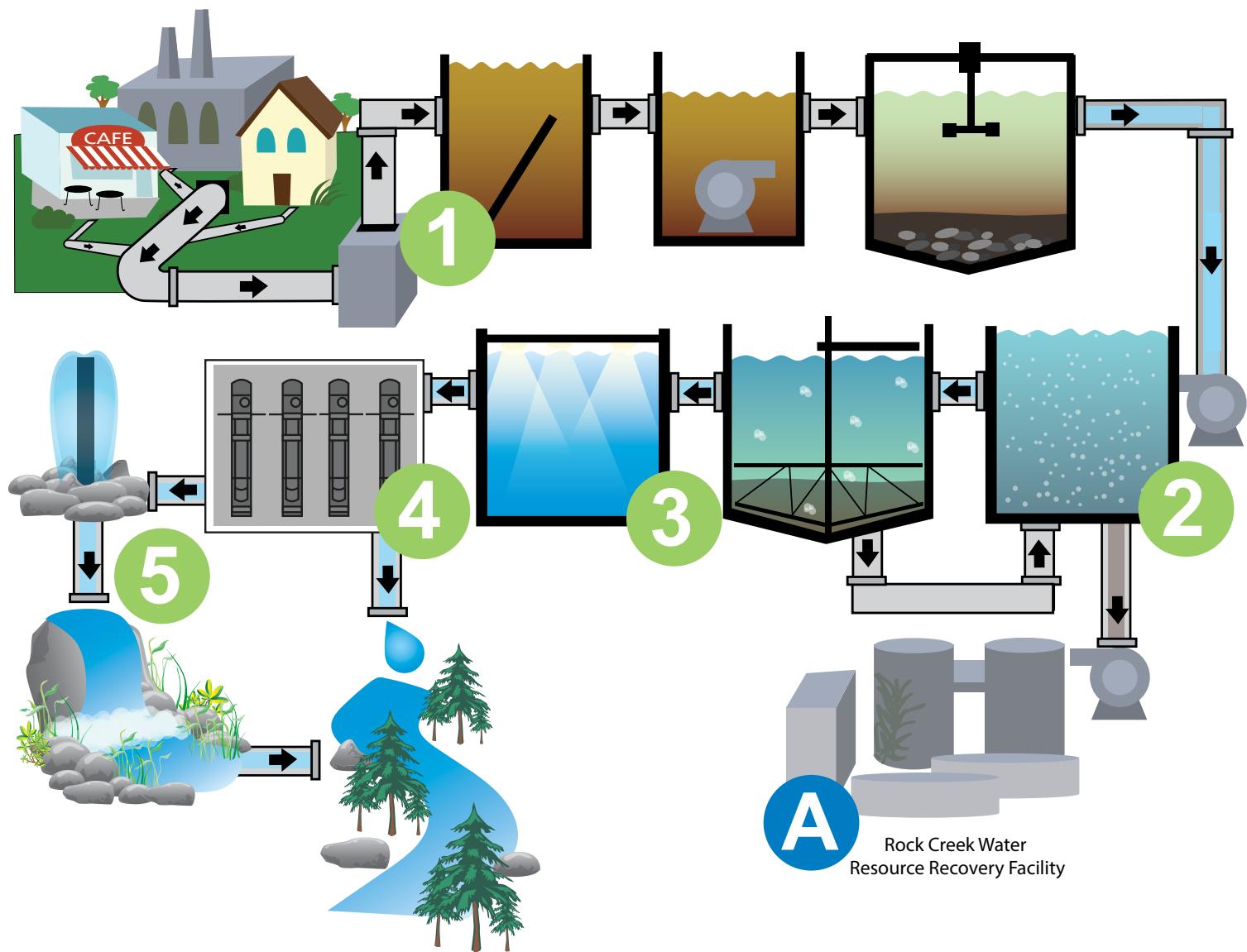


FOREST GROVE WATER RESOURCE RECOVERY — PROCESS



Liquids Recovery

At the Forest Grove Facility, used water flows through the plant through a series of processes: preliminary, secondary, disinfection and effluent discharge before it is discharged to the Natural Treatment System.

1 Preliminary Process

Flow from homes and industry eventually comes to the Forest Grove Headworks Building. Headworks prepares the incoming flow for downstream treatment by screening out rags and large objects that can cause equipment plugging and wear. As the flow leaves the Headworks Building, it is routed to the Influent Pump Station.

The Influent Pump Station pumps and measures the flow up to the Grit Removal Structure where heavy, not readily biodegradable objects such as sand, coffee grounds and corn kernels are removed. This "grit" is usually light enough to escape capture in the headworks, but still heavy enough to easily separate from the rest of the flow.

2 Secondary Treatment

There are many types of secondary treatment. The Forest Grove Facility employs conventional activated sludge. This means an environment is created in aeration basins

Solids Recovery

A The first half of the job at a water resource recovery facility is to remove foreign constituents from the liquid flow stream. Those foreign constituents are resources that can be reclaimed. The typical processes in solids treatment consist of thickening, digestion, dewatering, and phosphorus recovery.

However, no solids treatment is performed at the Forest Grove facility. The solids that are wasted from Secondary Treatment are pumped to the Rock Creek facility for treatment.

FOREST GROVE WATER RESOURCE RECOVERY — PROCESS

that allows the natural bacteria in wastewater to grow and thrive. The bacteria then consume contaminants in the water. As the flow leaves the aeration basin, secondary clarifiers form a wide spot in the flow that slows down the water. Bacteria sink to the bottom and sludge pumps return most of the bacteria to the front of the aeration basin to meet the incoming flow and remove further contaminants. A portion of the bacteria is removed (wasted) and sent to the Rock Creek facility to maintain a stable aeration basin population.

3 Disinfection

Disinfection inactivates harmful microorganisms. Forest Grove accomplishes this by the use of ultraviolet (UV) light. The plant flow passes in front of UV light, which inactivates the bacteria by damaging them so they can no longer multiply.

4 Effluent Discharge

After the flow leaves the plant, it is sent to the Natural Treatment System. The NTS creates an ecological bridge between the treatment facility and the watershed. Water is cleansed further, cooled and naturalized before it is returned to the Tualatin River, helping it maintain a healthy flow year around.

5 Natural Treatment System

The NTS consists of a vertical flow wetland and a natural treatment wetland.

The vertical flow wetland is designed to remove ammonia from the flow stream. Water passes through a media of rocks where bacteria are allowed to grow. These bacteria consume the ammonia in the water and convert it to nitrate.

The natural treatment wetland is a constructed wetland comprising of a number of different shallow ponds. Natural wildlife and plants thrive, and the plants that grow consume nutrients that are in the water. As these plants grow, they provide shade, which shields the flow from the warmth of the sun. The natural evaporation of the water also helps to cool the remaining flow.

As the water works its way through the wetlands, it eventually ends up at the Tualatin River. The flow is cooler than when it went into the wetlands and has a lower nutrient level and contributes to the health of the Tualatin River.

