Anatomy of a Bioswale

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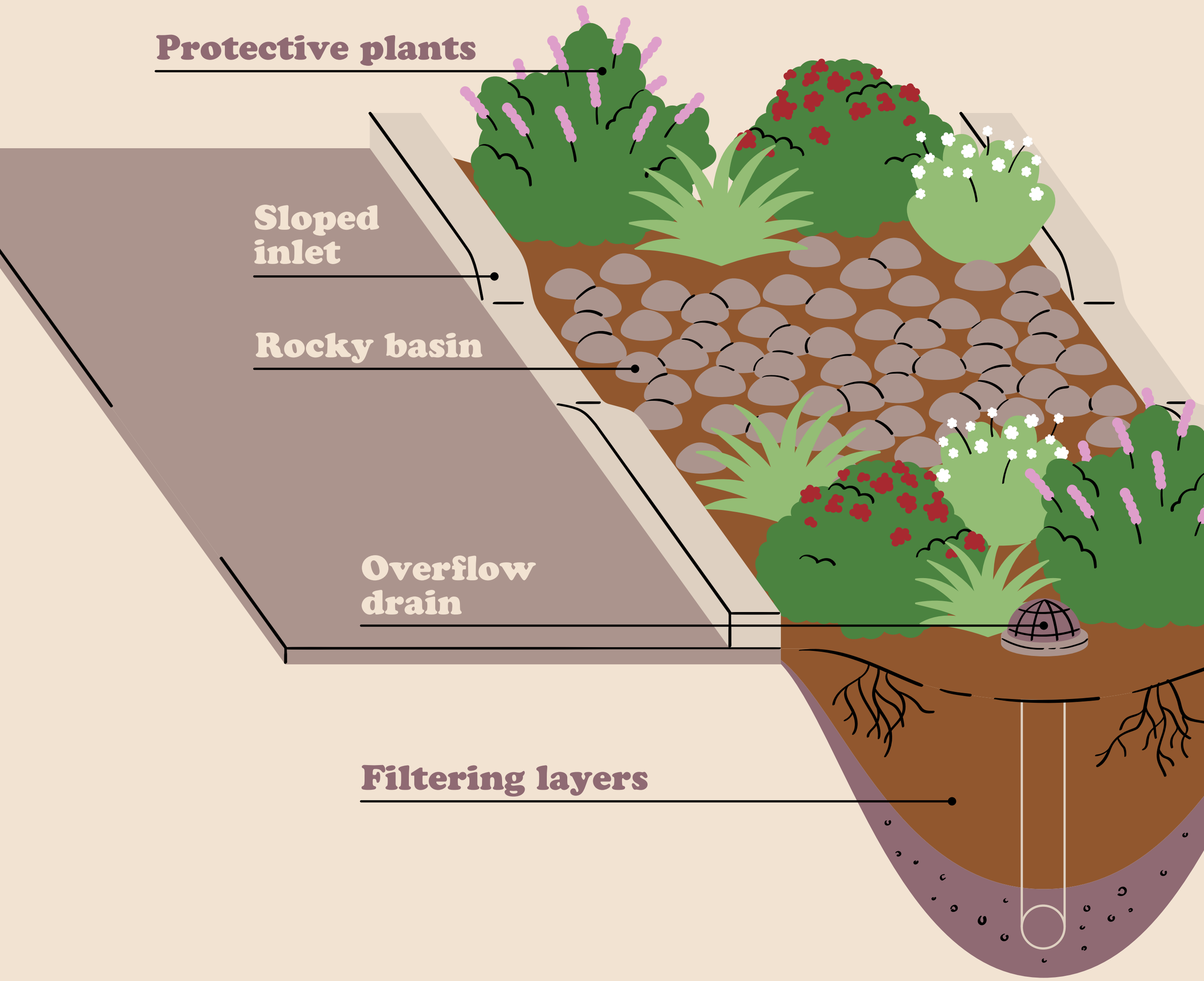
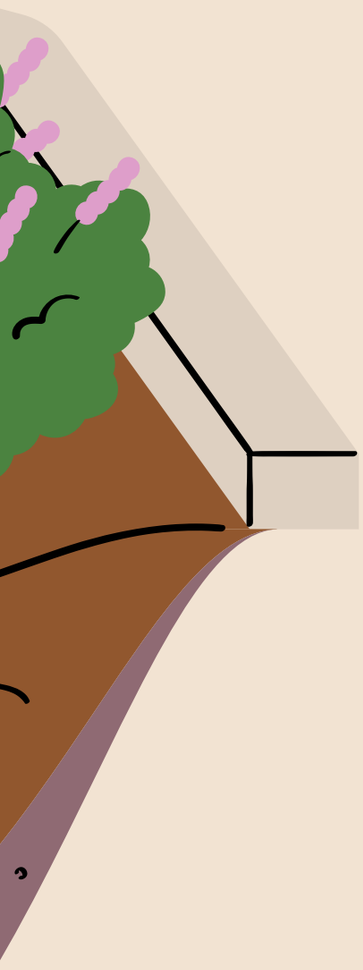


Here in Southern California, we sometimes go months or even years without substantial rainfall. And as the impacts of climate change ramp up, our dry seasons are becoming even drier. That’s why it’s more important than ever to find innovative ways to capture the rain we DO receive and return it to nature—including the urban storm runoff that rolls down our streets and sidewalks and would otherwise just enter the storm drain.

One way we can do that is by building **bioswales.** These carefully engineered systems don’t just help us collect rainfall and return it to our groundwater supply—they also help filter it, using natural means like plants and specially engineered soil media. Here’s how they work →



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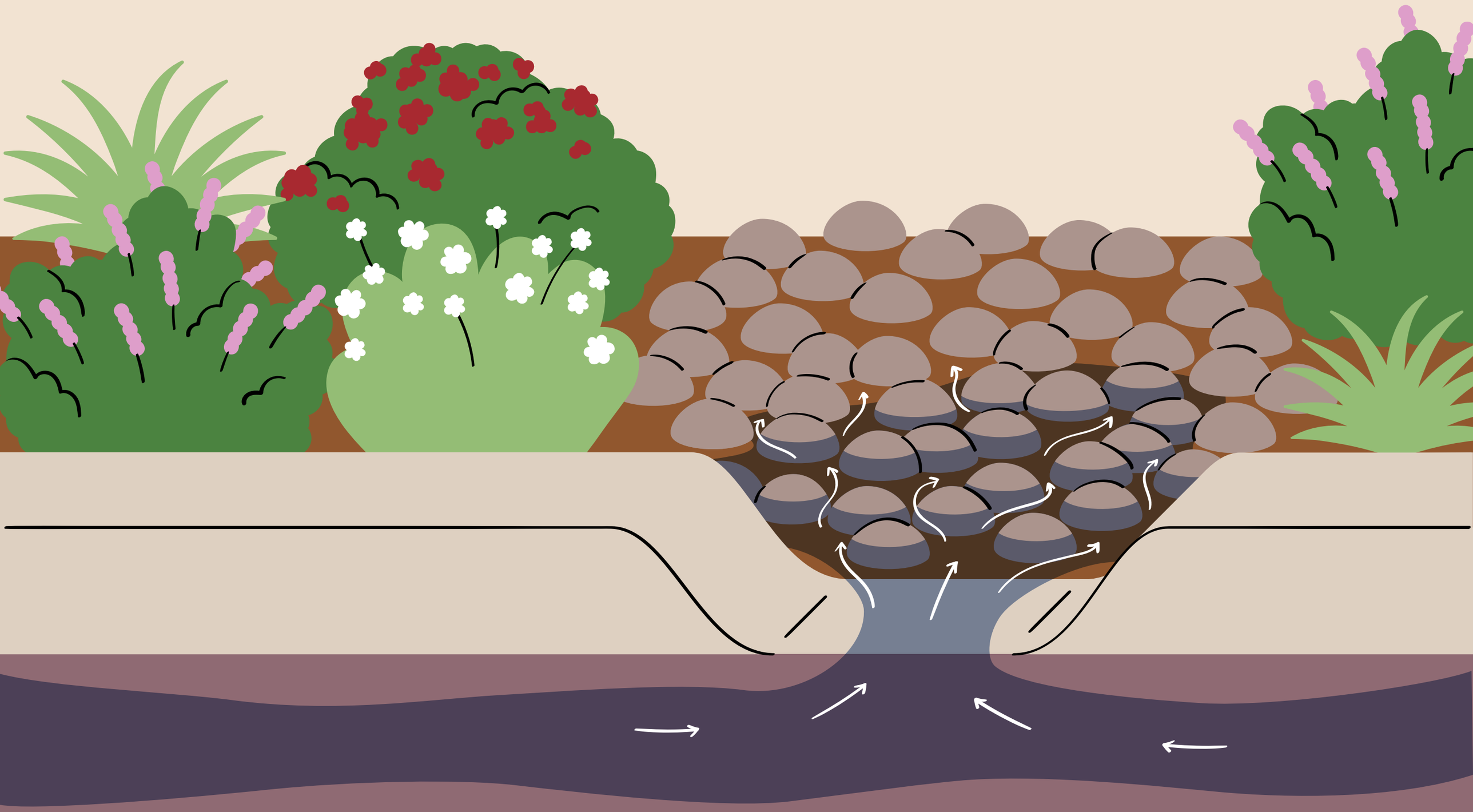

The Inlet

Stormwater left to its own devices will continue to flow over impervious surfaces, such as streets or parking lots, until it finds a storm drain. **The inlets on a bioswale intercept that water, allowing it to naturally funnel into the bioretention system.** Typically (but not always) cut into the curb, these inlets need to be carefully designed so that they reject trash, but still let water in. Inlet design is critically important to overall system function!

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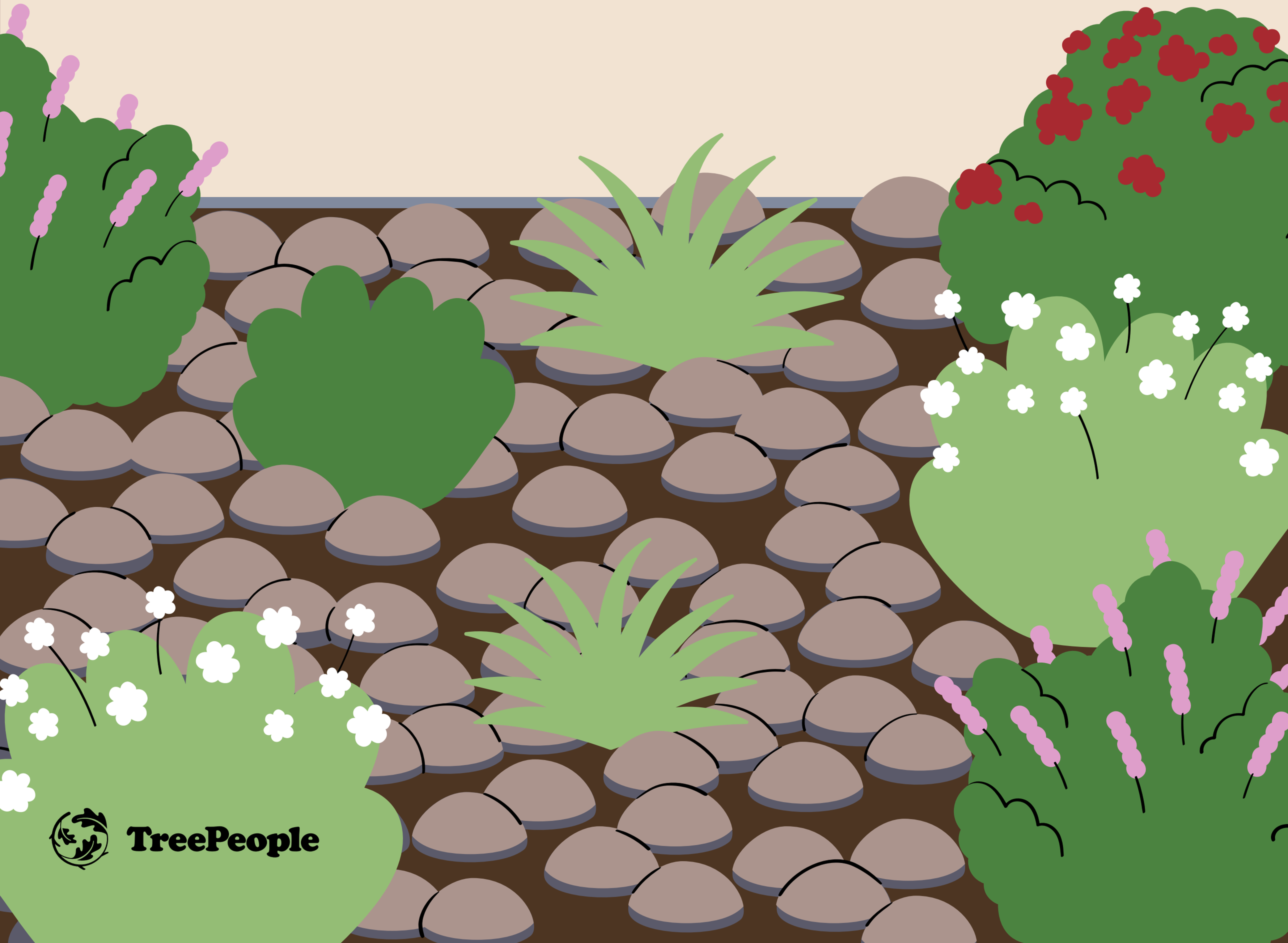
The Basin

As water enters a bioswale through the inlet, it encounters a base composed of fist-sized, stacked rocks. The rocks are not just pretty to look at—they play an important role, **slowing the water's flow to prevent it from eroding the nearby soil.** Depending on the depth of the swale, water will pool as it flows in and gradually be absorbed into the ground, which is why these swales will only occasionally have a filled pond—but not for long!



The Plants

Typically, these systems feature a combination of hardy native grasses, shrubs, and other plants that can tolerate both very wet and very dry conditions, as well as intense heat radiating from paved surfaces. This vegetation helps to **filter contaminants from the water as it is absorbed into the ground,** while also **uptaking nutrients vital for the plants.** The plants' deep roots also create important flow pathways, preventing the system from clogging, and their leaves can help capture air pollutants from nearby roads.

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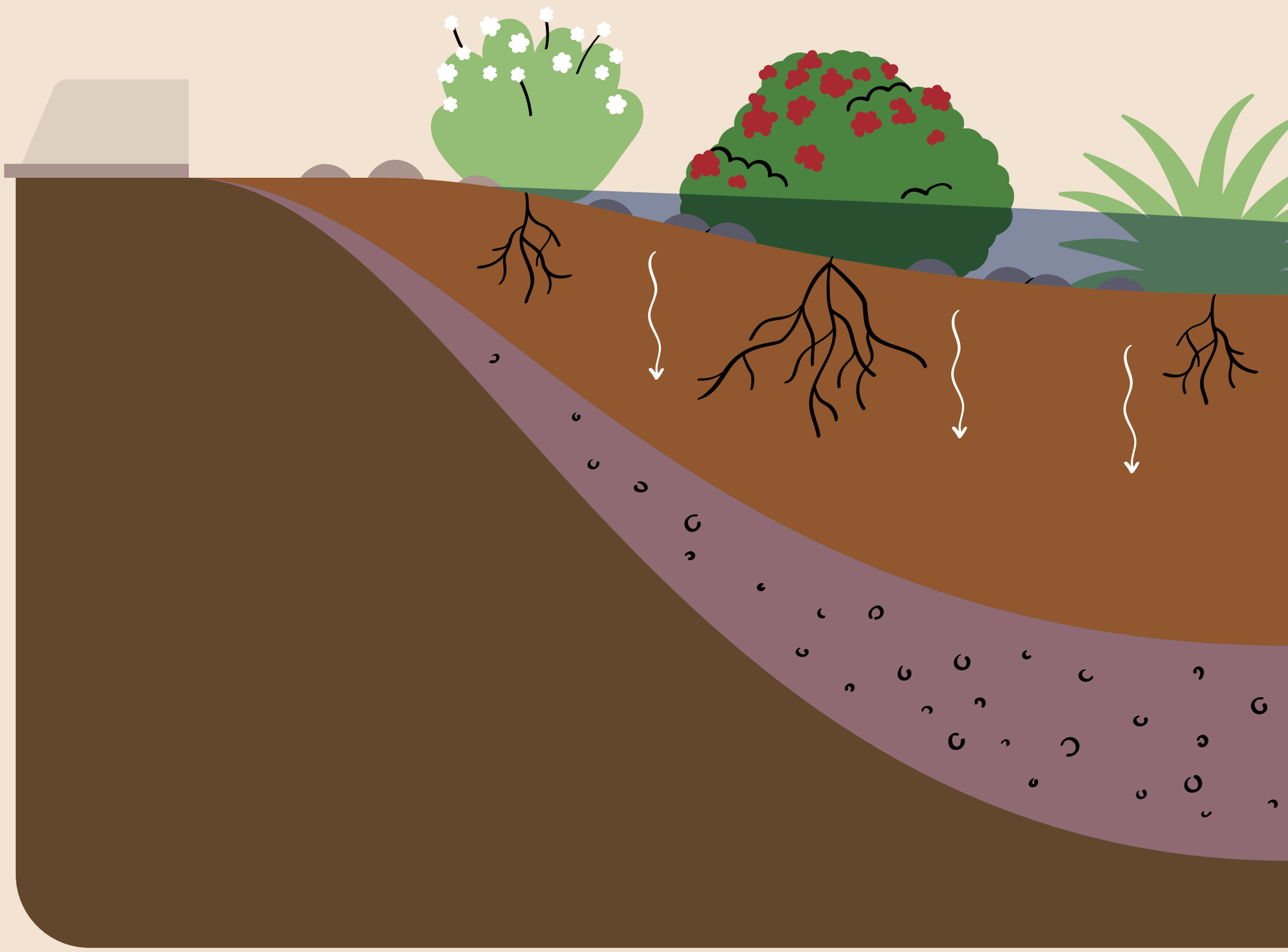

The Soils

A key component of this nature-based solution is the soil mixture. This carefully-engineered mix is several feet deep, and usually contains well-sorted sand, organic materials like compost and biochar, and other additives, which all help to improve filtration capacity. In addition to the plants, this mixture **filters out the contaminants the water was exposed to before it entered the system** (think: motor oil, gas, metals, etc.). The result of this is clean water entering the groundwater supply!

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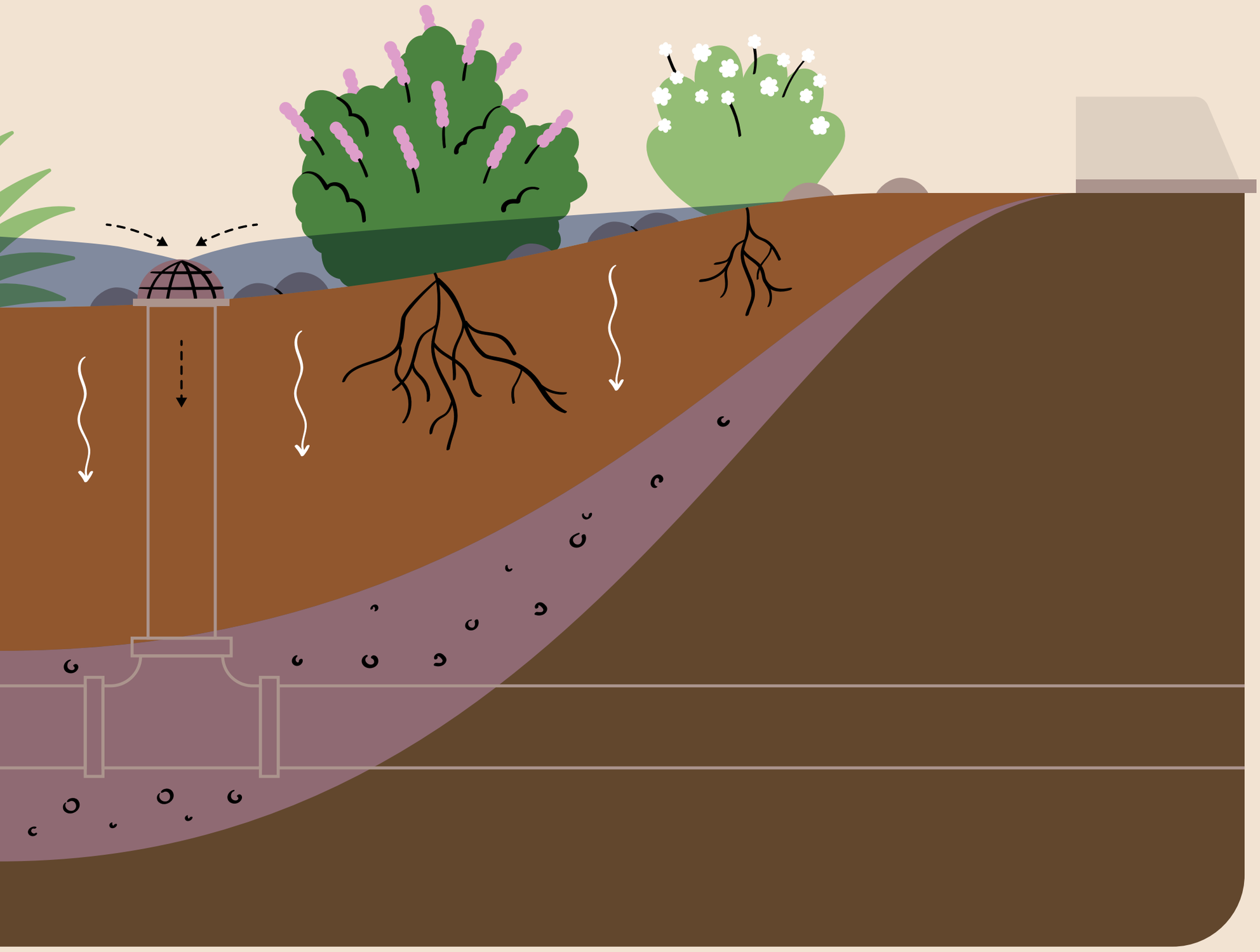

The Overflow Drain

It’s important that the system doesn’t overflow during big rainstorms, because it could damage the soil and plants! If more stormwater enters the system than it can handle, **the excess water flows through the drain like it would in a bathtub.** The emergency drain is connected to the regular storm sewer, which allows that water to flow away.

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Know of a bioretention system in your area? We want to hear about it!

TreePeople was recently awarded a grant to study these systems to ensure their designs work for our unique weather conditions (think those long months without any rain, followed by quick bursts of intense rainfall).

We’ve been on the hunt to find as many as we can, but we know nobody is more familiar with their neighborhood than the neighbors. So do us a solid, and let us know in the comments where we can find your local system!

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