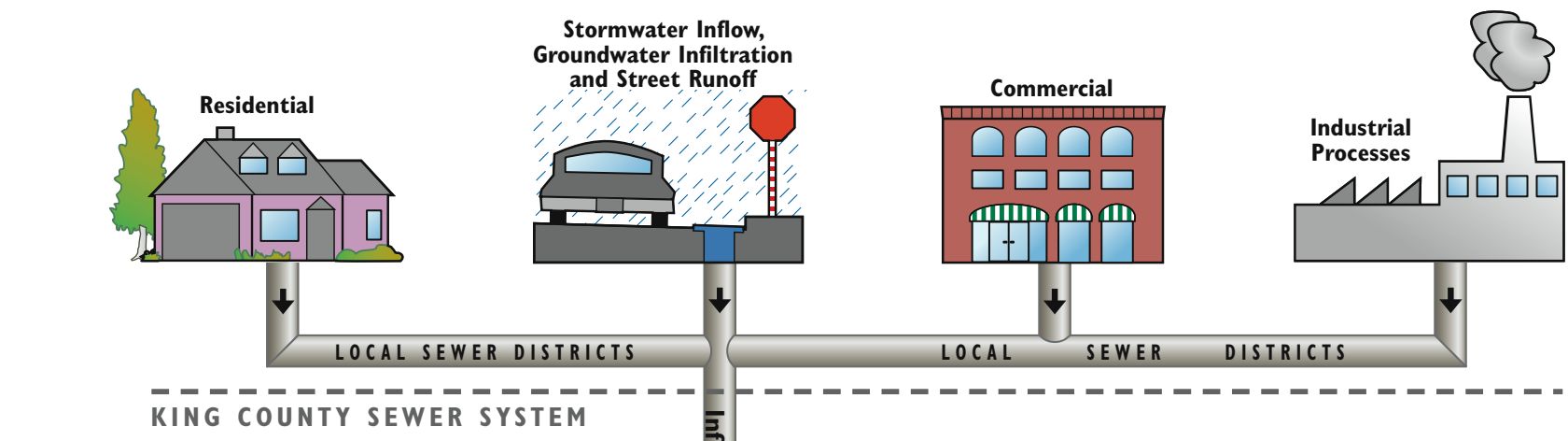
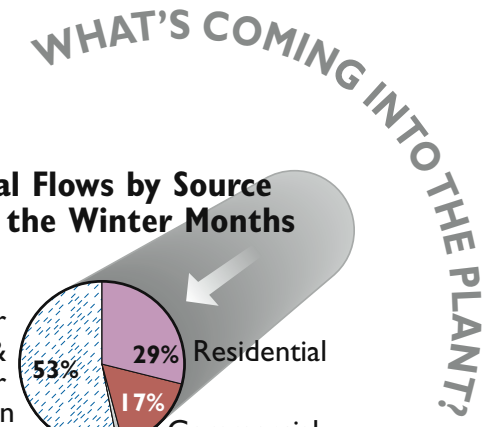


# WASTEWATER TREATMENT PROCESS

How is wastewater treated at King County's West Point Treatment Plant?



## PROCESSES WITHIN WEST POINT TREATMENT PLANT

### PRELIMINARY TREATMENT 'Taking out the trash'

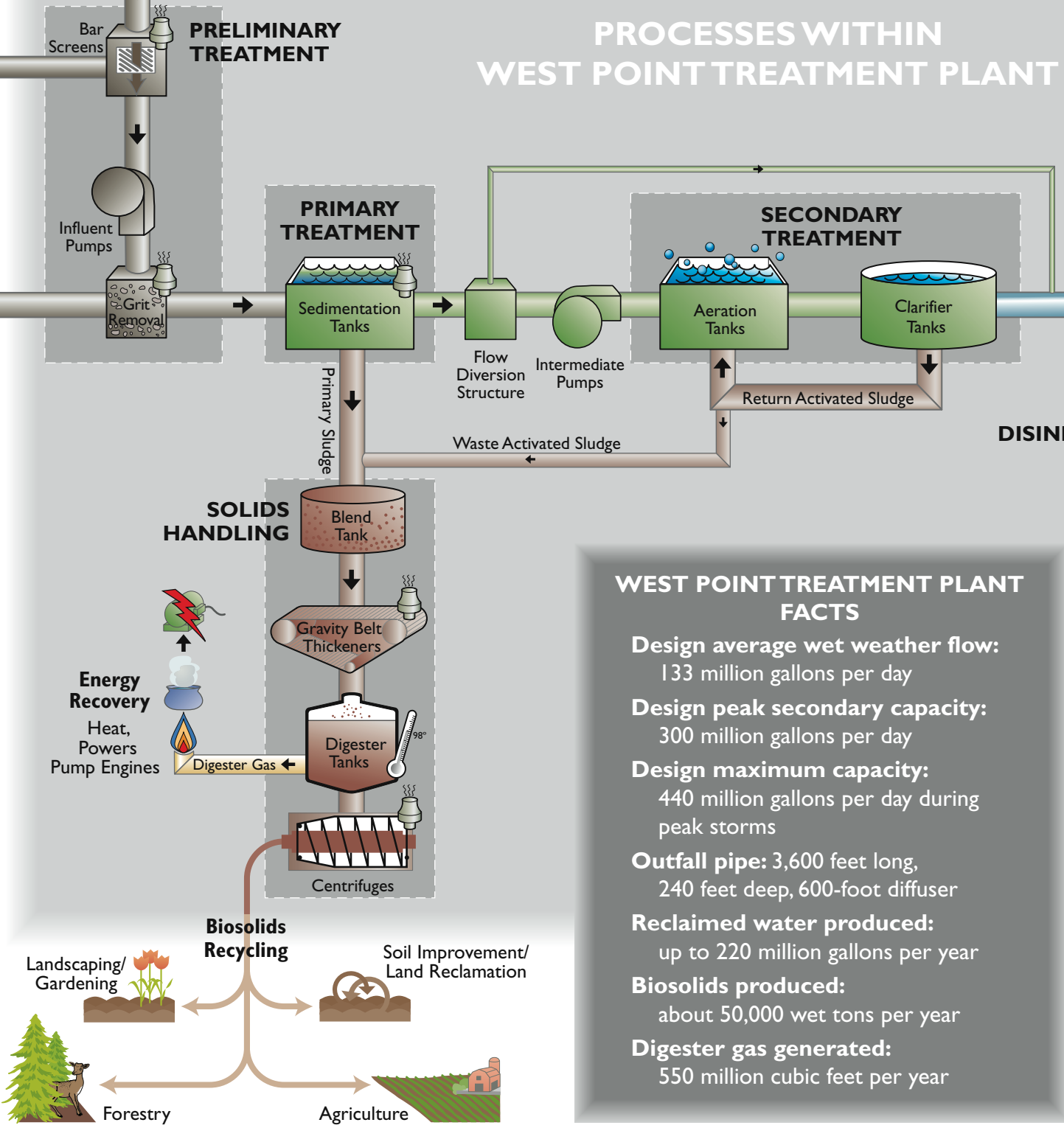
- Bar screens remove large debris like rags, paper, and leaves from wastewater (influent) as it enters West Point.
- After screening, wastewater is pumped into aerated grit chambers that remove sand and gravel.
- The trash and grit collected during this process are trucked to a landfill.

### PRIMARY TREATMENT a physical process 'Scum floats; sludge settles'

- Wastewater settles in long tanks called primary sedimentation tanks. Heavy organic material sinks to the bottom (as sludge), and light material (fats, oils and greases) floats to the top (as scum).
- Skimmers remove scum from the surface of the water and conveyor belts remove sludge from the tank bottom. Both are then sent onto the solids handling process.
- The treated water, now called primary effluent, flows to the secondary treatment process. Primary treatment removes approximately 60 percent of the organic solids.
- West Point's primary treatment system is designed to handle a peak combined flow of 440 million gallons a day (mgd).

### SECONDARY TREATMENT a biological process 'Friendly bugs eating contaminants'

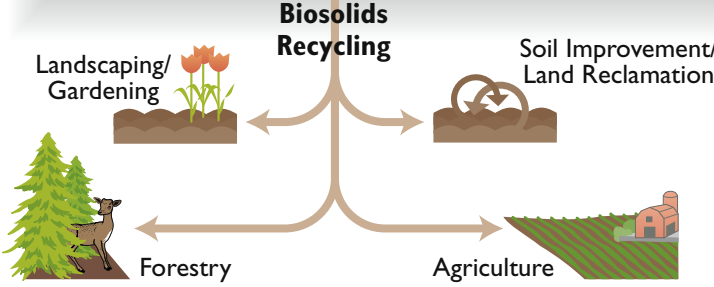
- Primary effluent is pumped to aeration tanks where oxygen is added to encourage growth of useful bacteria naturally present in the wastewater.
- Bacteria eat suspended and dissolved organic material in the water. In the process, they produce more bacteria.
- The wastewater then goes to secondary clarifiers, large round sedimentation tanks where bacteria settle to the bottom of the tank as secondary sludge.
- Most (90 percent) of secondary sludge goes back to the aeration tanks to keep a healthy bacteria population going; the rest goes to the solids handling process.
- The remaining water — secondary effluent — leaves the clarifiers at least 85 percent cleaner, typically close to 95 percent, than when it entered West Point.



**ODOR CONTROL – 'the Sniff Test'**  
In order to minimize odors, we cover or contain the potentially smelly processes and collect the air for treatment.

### WEST POINT TREATMENT PLANT FACTS

- Design average wet weather flow: 133 million gallons per day
- Design peak secondary capacity: 300 million gallons per day
- Design maximum capacity: 440 million gallons per day during peak storms
- Outfall pipe: 3,600 feet long, 240 feet deep, 600-foot diffuser
- Reclaimed water produced: up to 220 million gallons per year
- Biosolids produced: about 50,000 wet tons per year
- Digester gas generated: 550 million cubic feet per year



### DISINFECTION 'Zapping pathogens'

- Secondary effluent is chlorinated, destroying most remaining pathogens, or disease-causing bacteria.
- To protect the receiving water environment, the final effluent is dechlorinated before it is released through an outfall pipe and diffuser into Puget Sound.

### RECLAIMED WATER 'Saving H<sub>2</sub>O'

- After disinfection, some secondary effluent undergoes advanced treatment (coagulation, filtration, disinfection) to reduce use of water for irrigation and some plant processes.

### SOLIDS HANDLING

- Creating biosolids and energy, 'Blend, thicken, digest, dewater'**
- Organic solids — primary and secondary scum and sludge from the sedimentation and clarifier tanks — are blended and thickened in a gravity-belt thickening process. The solids are then pumped to digester tanks where anaerobic bacteria at 98 degrees Fahrenheit break down organic material and kill pathogens. The activity of the bacteria creates digester gas and reduces the solids mass by 50 percent.

