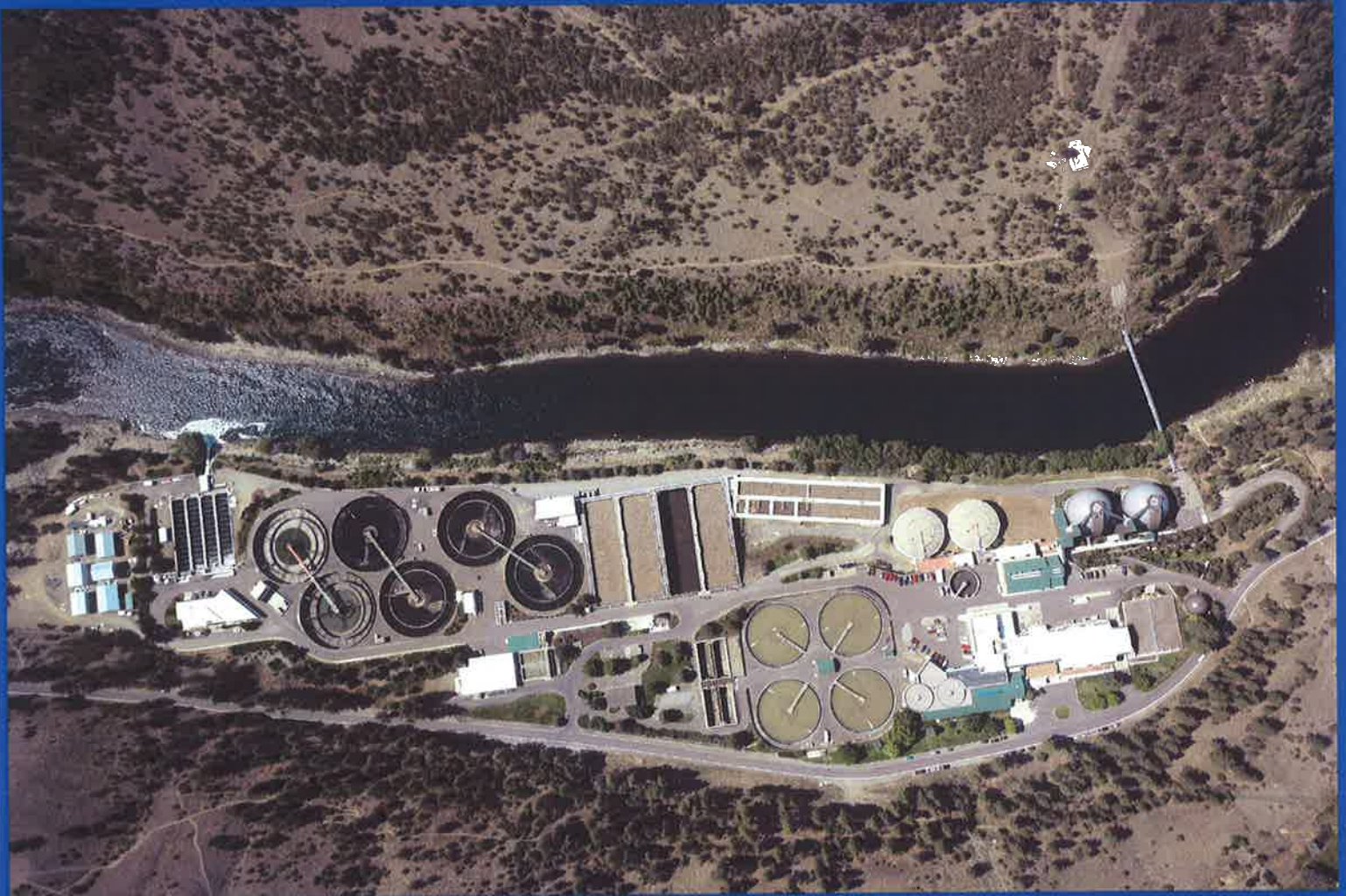


Riverside State Park Water Reclamation Facility (RPWRF)



Next Level of Treatment and
Water Reuse Pilots



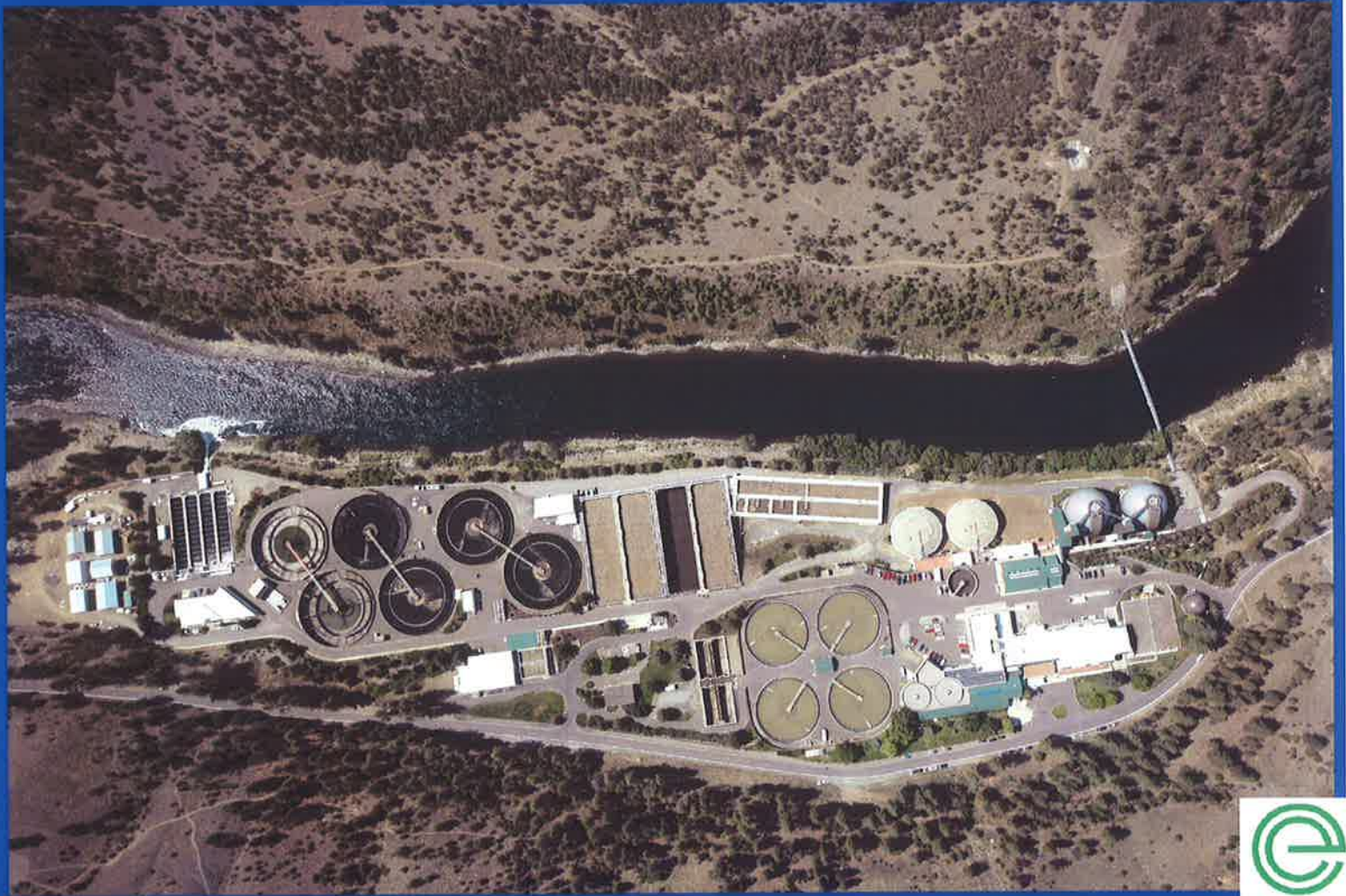
Riverside State Park Water Reclamation Facility (RPWRF)

Next Level of Treatment Pilot



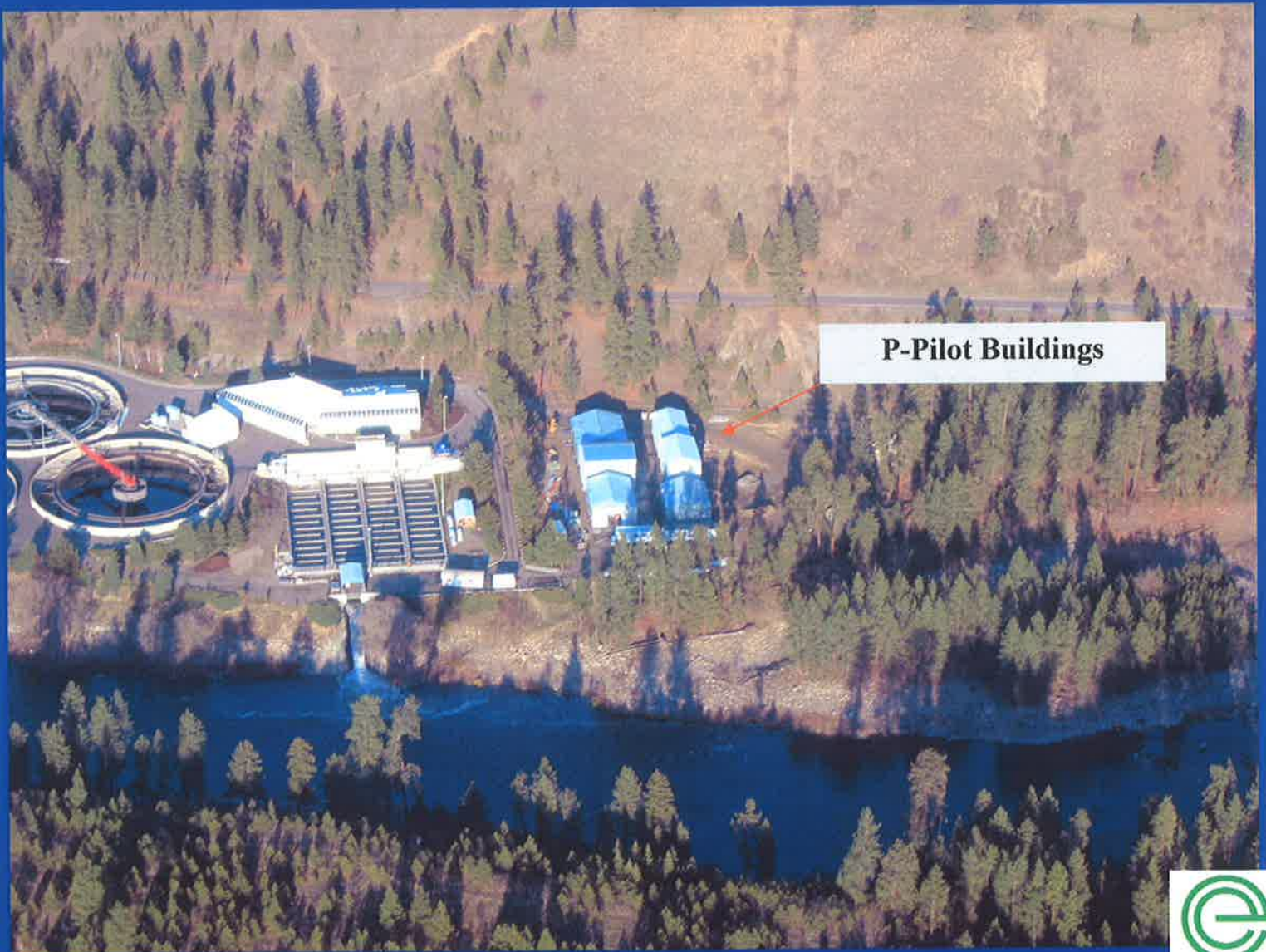
*The photos contained in this document are courtesy of
Esvelt Environmental Engineering.*

Spokane RPWRF 2009



RPWRF

P-Pilot Study Location



P Pilot Buildings

“Treatment Town”



Six technologies are being tested to determine which one(s) are best suited for Spokane's Next Level of Treatment. They are adapted for use in treating municipal wastewater from their origins as drinking water treatment (e.g. river water) or other waste treatment processes (e.g. mining).

Two stages of treatment are being tested to remove phosphorus down to below 50 parts per billion. The S, K and C units provide first stage “sedimentation” treatment. The F, B and Z units provide second stage “filtration” treatment. In general, a coagulant (metal salt) is added to bind with dissolved phosphorus to form “floc” particles big enough to settle out in the first stage or be filtered out in the second stage. Polymer is used in most processes to enhance performance. Effluent from the Pilot is blended with plant effluent for disinfection and discharged to the river. Next Level of Treatment will meet Washington's Class A Reclaimed Water standards, suitable for irrigation or industrial uses and approved for human contact, but not for use as drinking water.



1st Stage Units Sedimentation

These units are not filters; the particles settle out.

S Building

Sedimentation Units



“S” – conventional Sedimentation, provided by CORIX of British Columbia. The particles are very light and settle slowly, so it requires large tanks.

K Building

Sand Ballasted Sedimentation



“K” – ballasted sedimentation, provided by Kruger of North Carolina. The particles form around grains of sand, which causes them to settle faster, allowing smaller tanks. After settling, the phosphorus is stripped off and the sand mostly recycled.

C Building

Magnetite Sedimentation Unit



“C” – variation on ballasted sedimentation, provided by Cambridge Water Technologies of Massachusetts. The particles form around grains of magnetite, which is heavier than sand, causing even faster settling. Magnetite is magnetic, so magnets are used to help remove the particles from of the water. The magnetite is mostly recycled.



2nd Stage Units Filtration

These units physically strain out particles too small to settle.

F Building

Dual Media Filter Units



“F” – conventional dual media granular Filter, also provided by Corix. The particles are filtered out as the water slowly sinks through beds of anthracite (coal) and fine sand. Slow settling requires large tanks. Occasional backflushing is required, so redundant tanks are needed for everyday operation.

B Building

Upflow Sand Filter Units



“B” – continuous upwash sand filter, provided by Bluewater of Idaho. Water continuously flows upward through chemical-coated sand to capture phosphorus, avoiding the need for regular back-flushing. The phosphorus is stripped off the sand and the sand is mostly recycled.

Z Building

Membrane Filter Units



“Z” – membrane filter, provided by Zenon of Quebec. Particles larger than the membrane’s pores are strained out as the water passes through the membrane. The membranes require chemical cleaning and occasional replacement, so redundant units are needed.