

Empire Stormwater Projects

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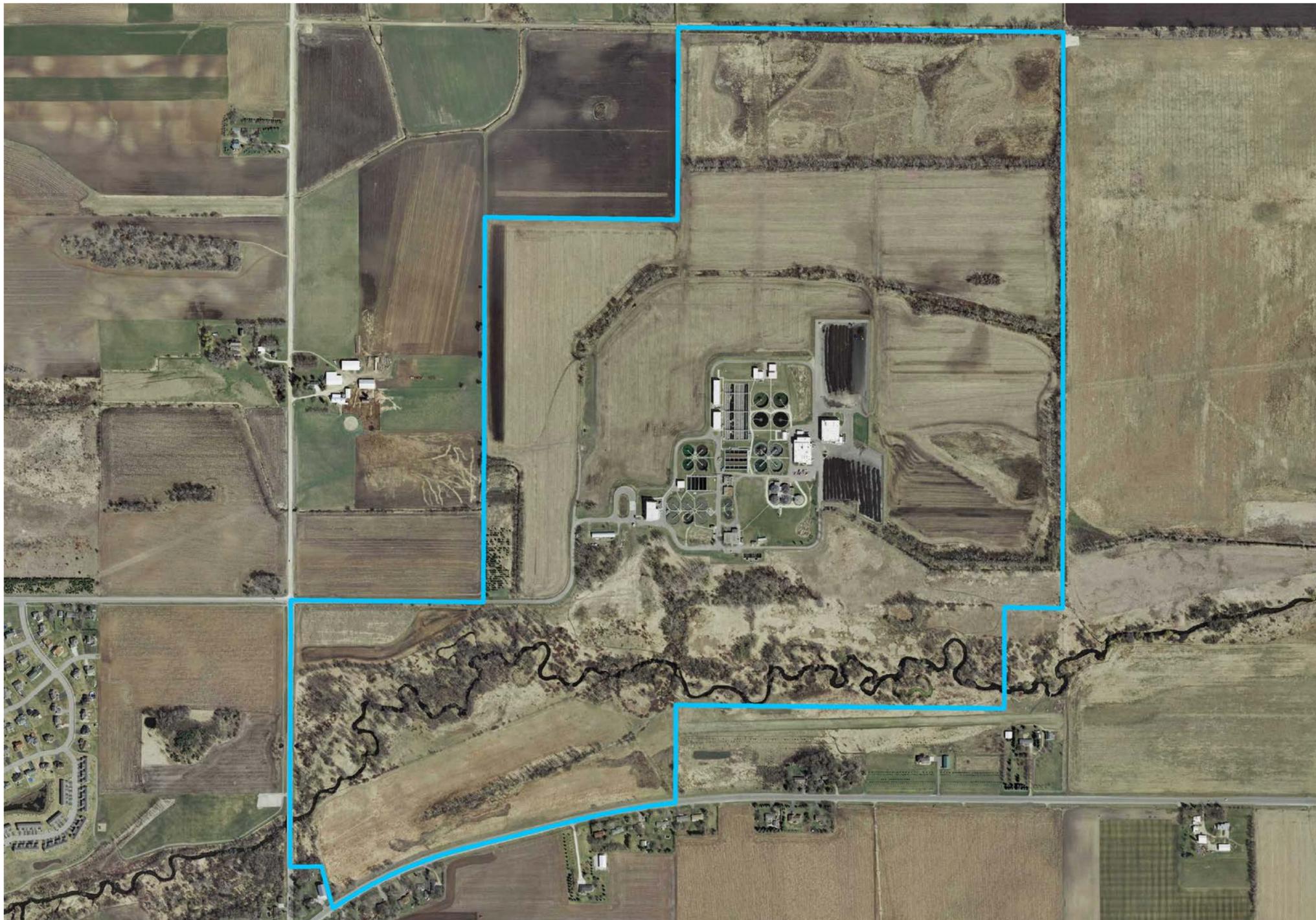
Environment Committee 10/22/2013



**MCES staff and partners
successfully designed, built,
maintained and observed
innovative stormwater practices at
the Empire WWTP**



The practices were installed in 2004-2007 during the WWTP expansion

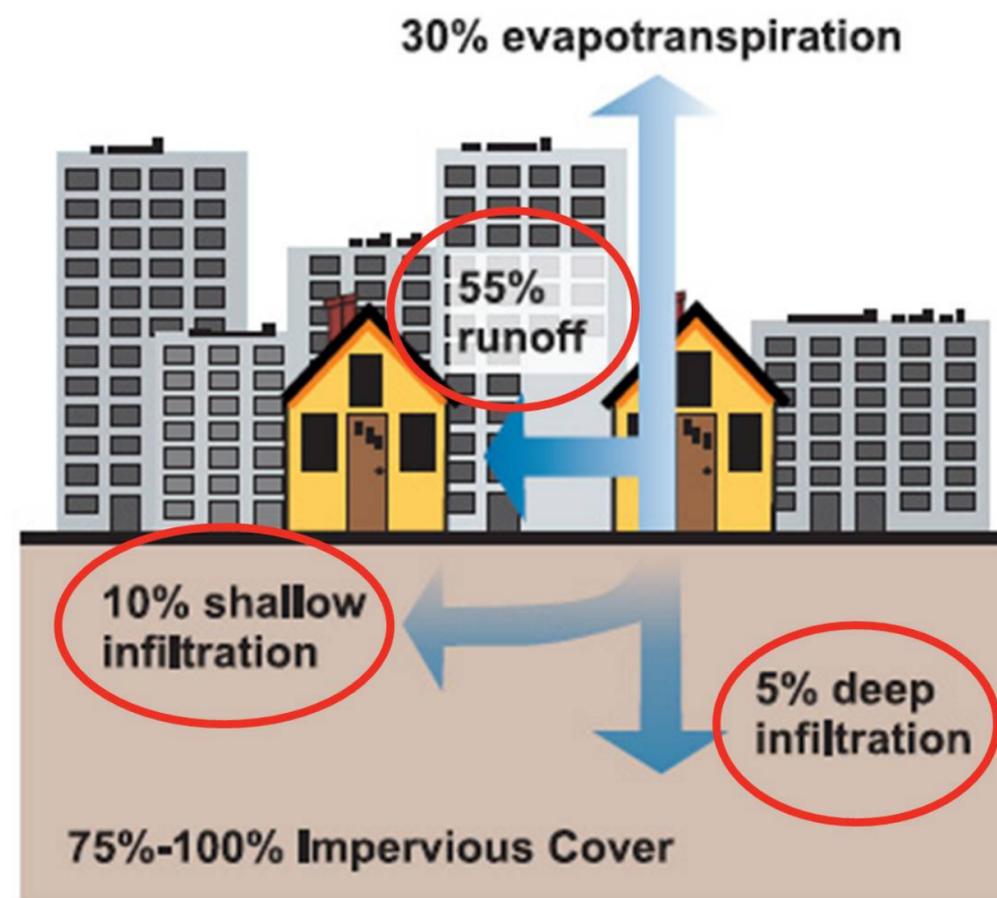
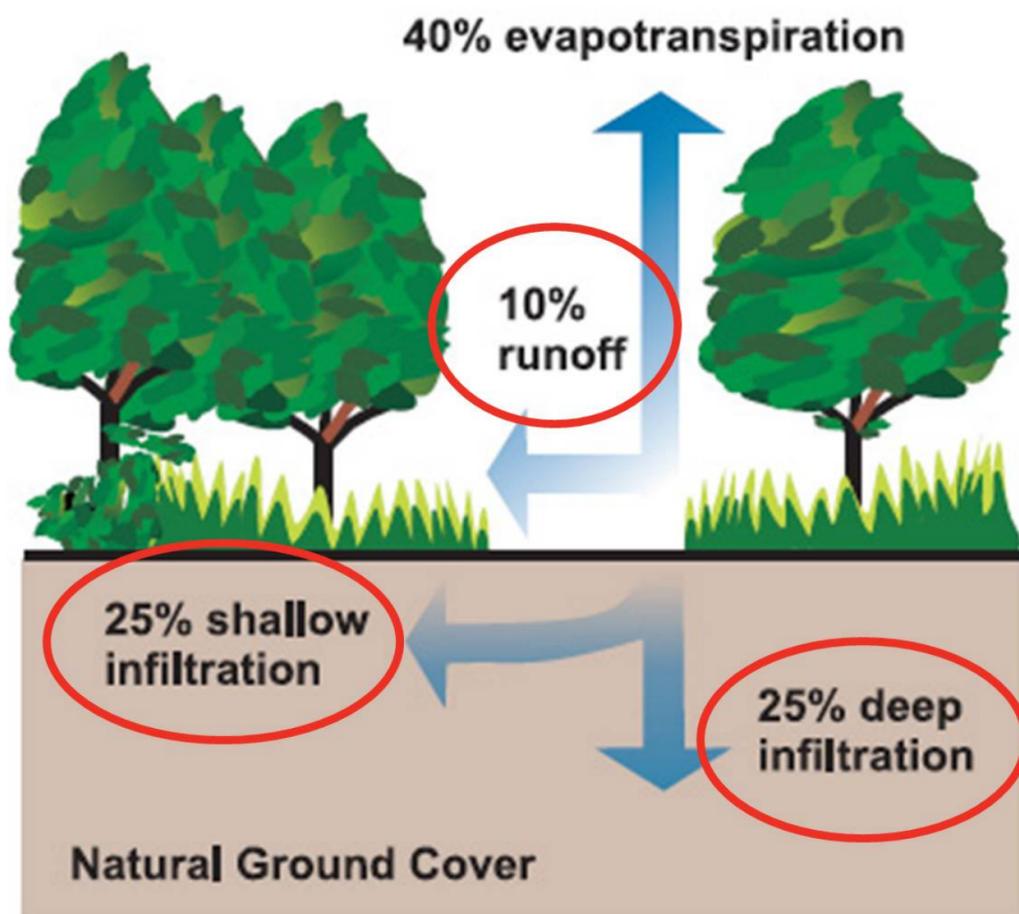


Innovative stormwater practices protect surface waters and encourage aquifer recharge through infiltration



**Each raindrop
is treated as
an asset,
rather than a
waste
product!**

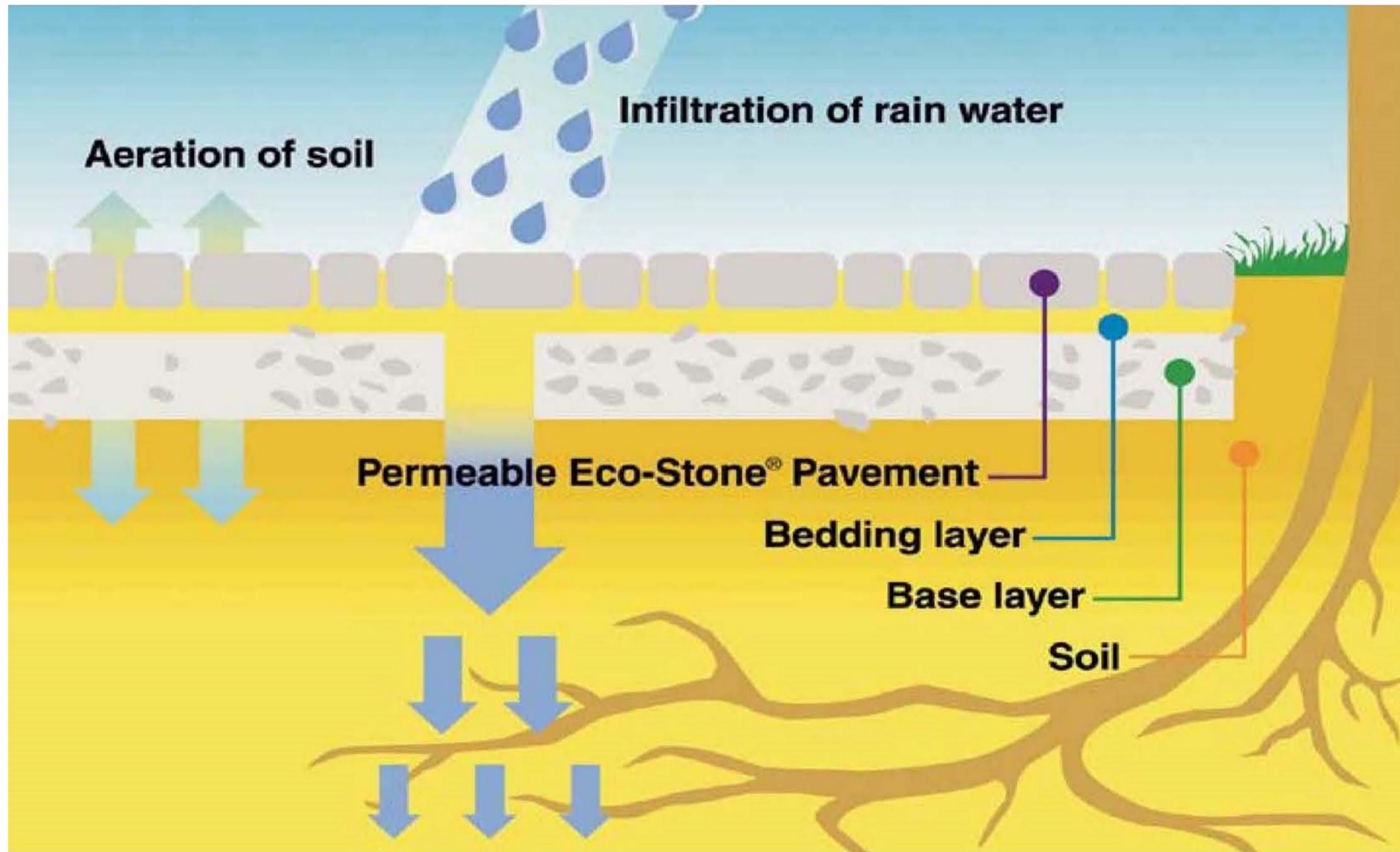
Innovative stormwater practices encourage the developed landscape to function like a natural landscape



Empire Innovative Stormwater: Pervious paver parking areas



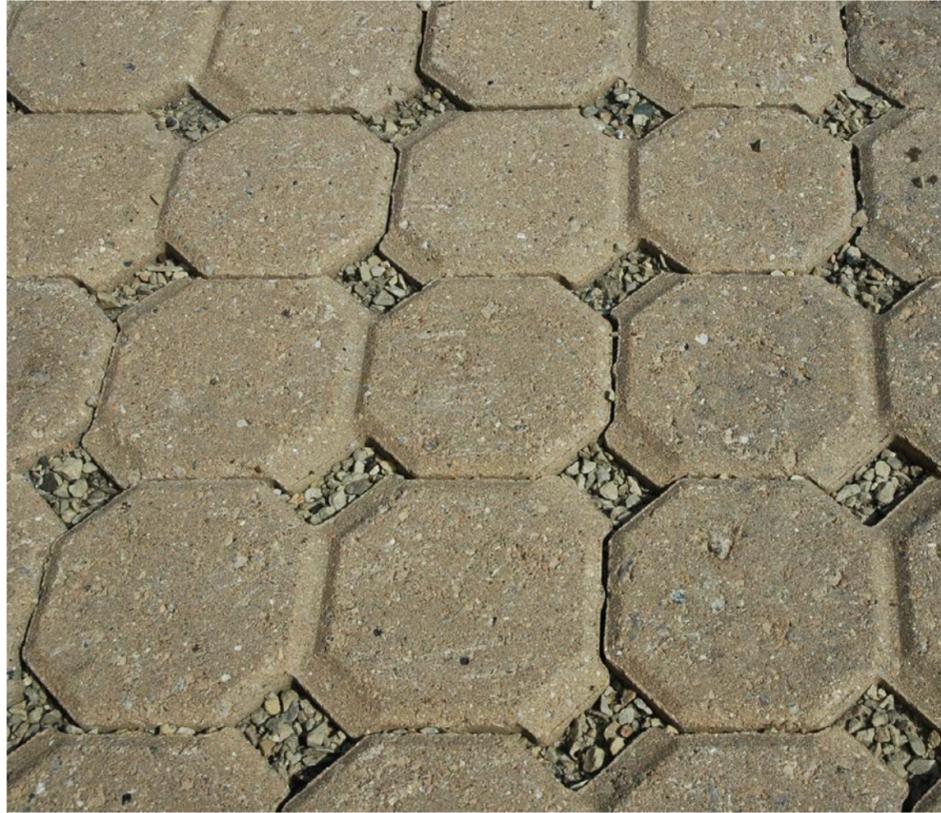
Pervious paver parking areas



Pervious paver parking areas



Pervious parking surfaces



Pervious concrete

Empire Innovative Stormwater: Green roof

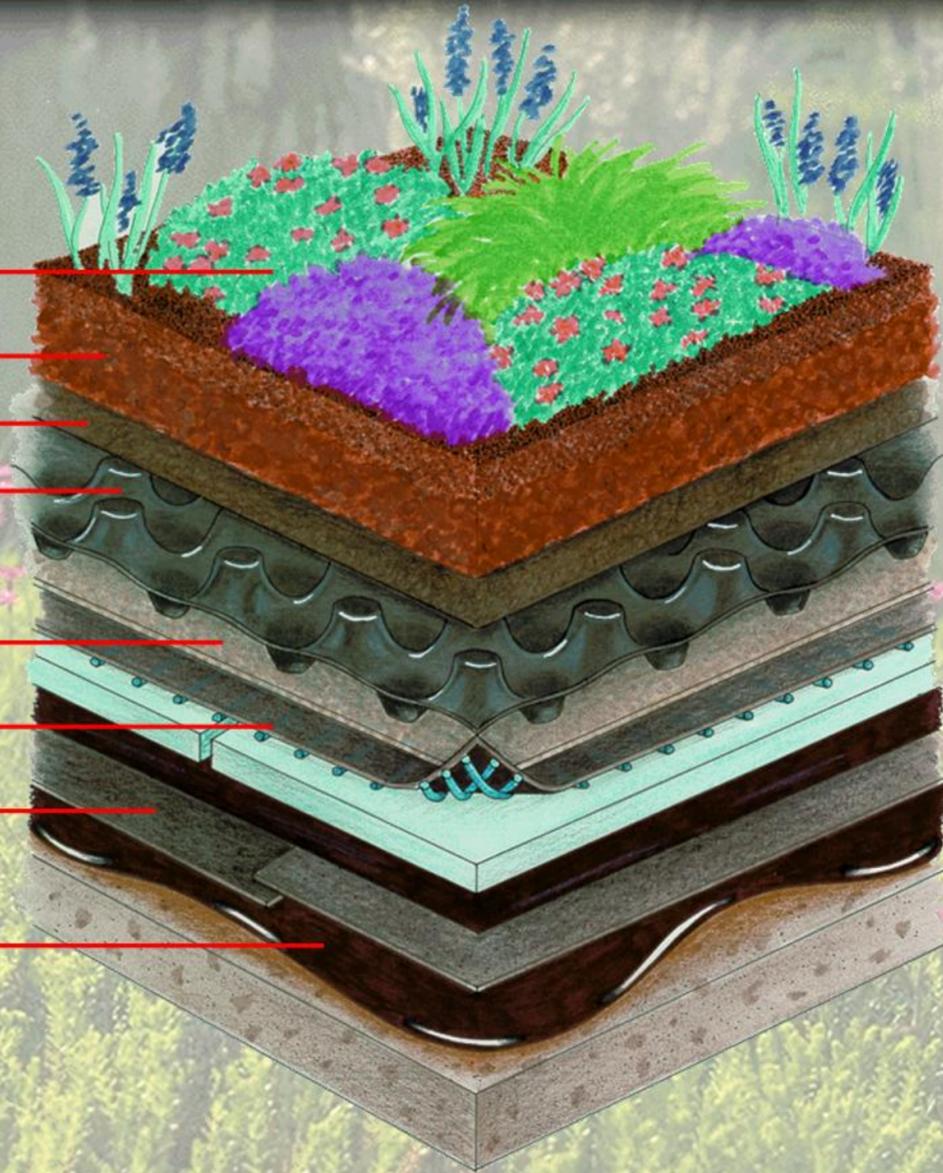


Green roof

Garden Roof®

Garden Roof® - Insulated

- **Plants**
- **Lightweight soil**
- **System Filter SF**
- **Floradrain - water drainage, retention & aeration layer**
- **SSM 45 - moisture retention layer**
- **STYROFOAM* with air layer**
- **Hydroflex RB - root barrier & protection course**
- **Monolithic Membrane 6125-FR**



Green roof located on RAS Building



Empire Innovative Stormwater: Raingardens (Infiltration Basins)



Raingardens (Infiltration Basins)



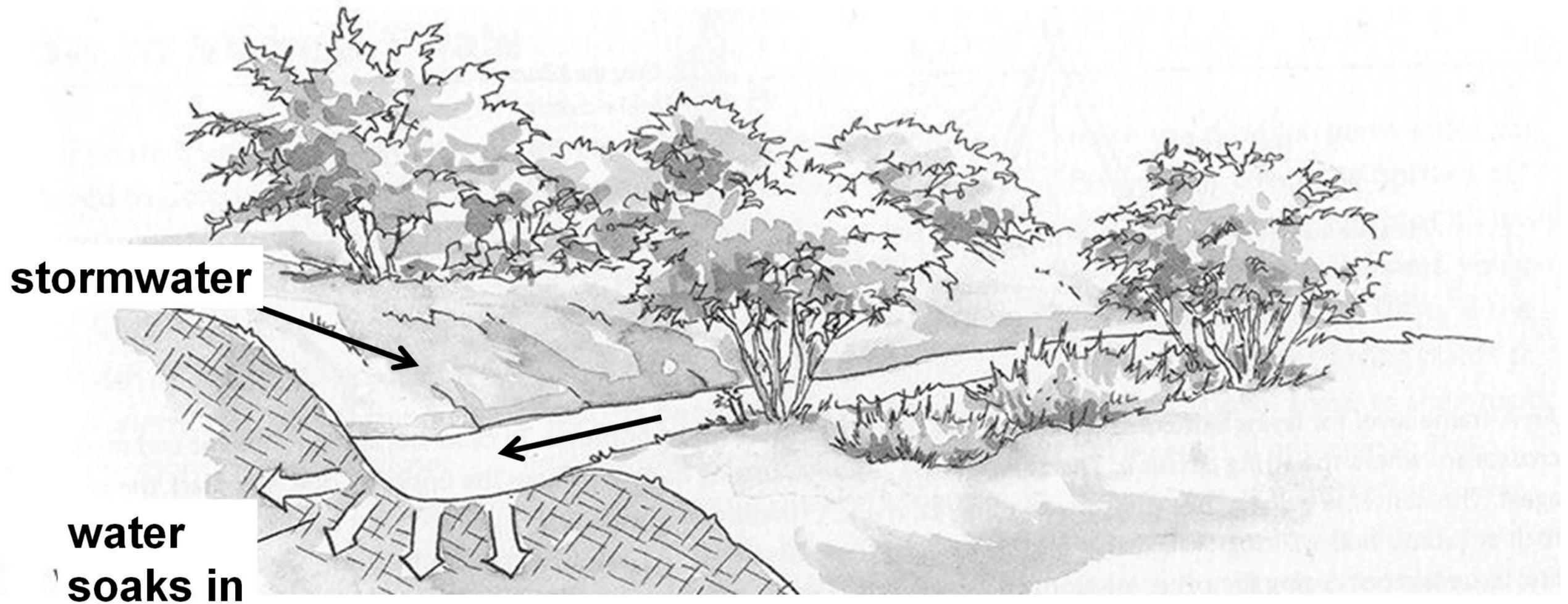
Raingardens (Infiltration Basins)



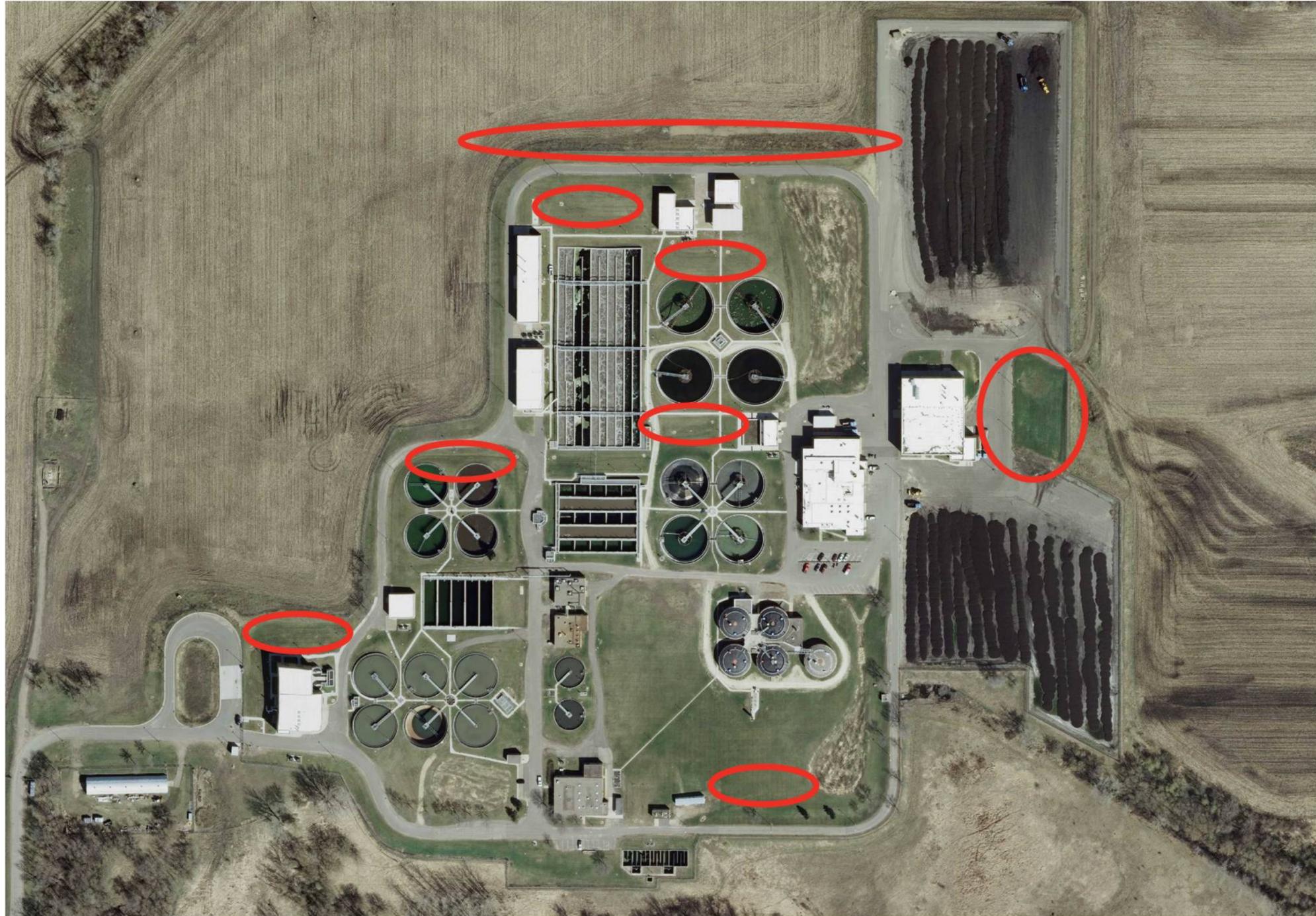
Empire Innovative Stormwater: Grassed drainage swales



Grassed drainage swales



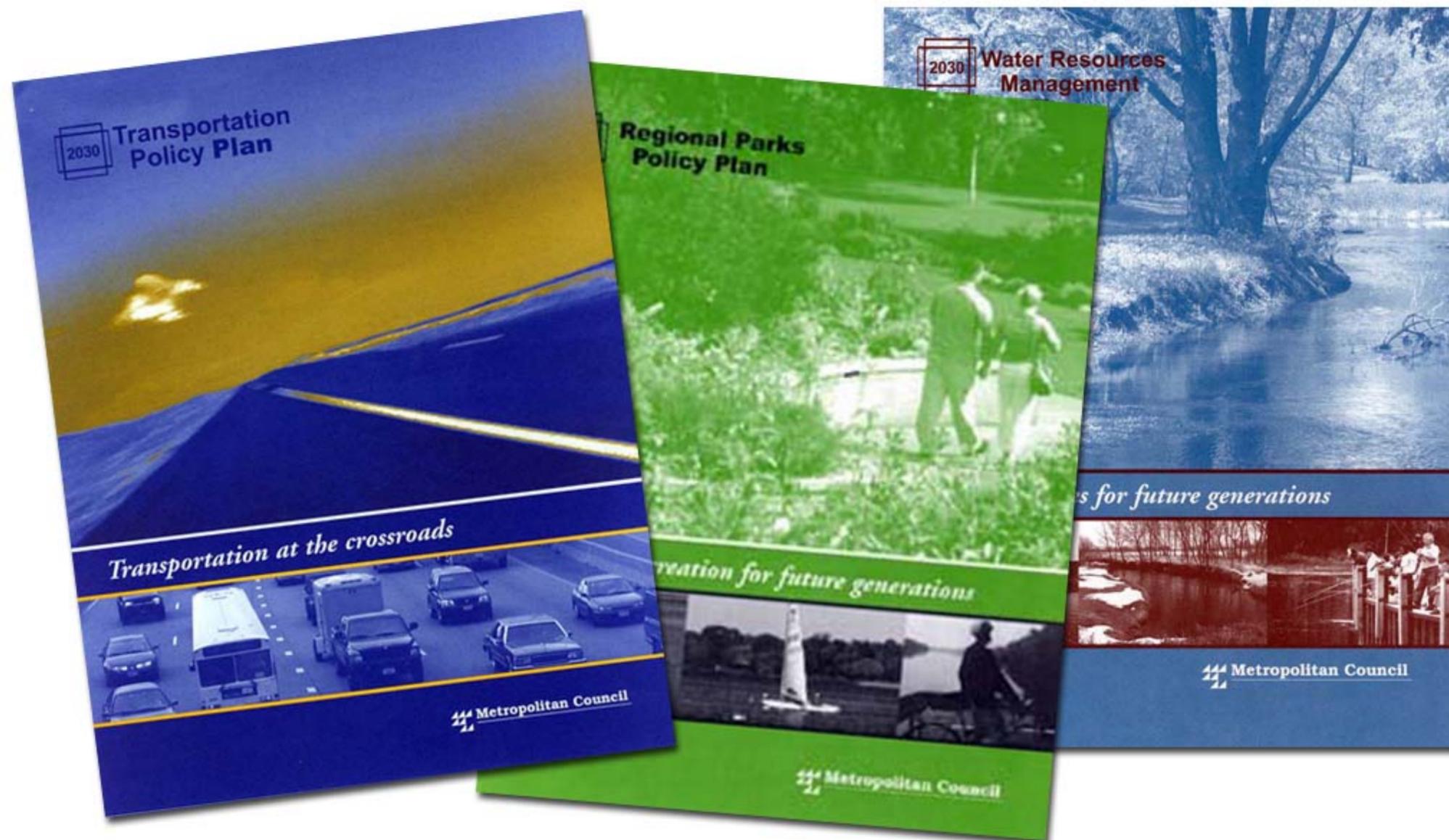
Grassed drainage swales





Final Result: Since 2007 there has been no surface stormwater runoff from the Empire WWTP process area

MCES staff are eager to leverage lessons learned at Empire to lead regional and local stormwater management efforts through the Council's Water Resource Policy Plan





METROPOLITAN
C O U N C I L