



Site Plan Along LA River, Analyzed Floodplain in CFD Model

**Client:** Los Angeles River Revitalization Corporation

**Services Provided:**

- ✓ Floodplain Analysis of Los Angeles River
- ✓ 3-D Computational Fluid Dynamic Modeling for Shear Stresses
- ✓ Alternatives Site Plan Analysis
- ✓ Pollutant Load Reduction Estimation
- ✓ LA River Restoration Design

**Project Objective**

Piggyback Yard, approximately 125 acres of land owned by the Union Pacific Railroad, is located in downtown Los Angeles on the east bank of the Los Angeles River, just upstream of the 101 Freeway. The site is being investigated as a potential restoration/revitalization project compatible with existing rail uses. The four “visionary” goals of this project are water, open space, connectivity, and community. For water, the conceptual plan is to help restore and revitalize the Los Angeles River while promoting integrated flood management.

**Geosyntec’s Scope of Services**

Geosyntec’s scope of work has been to develop and evaluate hydraulic and hydrologic criteria for three different development scenarios for the Piggyback Yard Conceptual Master Plan. These three different mixes of developed and open space are being investigated in order to uncover and understand critical design considerations and to estimate the potential water supply, water quality, and flood attenuation benefits of the site. Geosyntec has gathered and reviewed available data and project concepts and operational plans, as well as historical Los Angeles stream flow records such as volumes, velocities, and stage heights, and available data for storm drains running through the site.

Hydraulic criteria are being developed in a coordinated effort between the US Army Corps of Engineers HEC-RAS model and a full 3-D Computational Fluid Dynamic model for analysis (ANSYS-CSX) where Geosyntec has quantified flow velocity, shear force, depth, and volume for three different sets of river flows; dry weather at 80 cfs, low flow at 6,000 cfs, and flood flows at 104,000 cfs. For the water quality analyses for the stormdrain daylight and natural treatment system design, water quality data was estimated from land use and LA County “Event Mean Concentration” (EMC) data.

**Notable Accomplishments**

Developed a 3-D model and provided expert opinions to allow for hydraulic/hydrologic evaluation of several different design alternatives with complex geometry. This modeling has provided heightened confidence that the selected design will result in stable river flows. The feasibility study has been presented in multiple public forums and is well accepted by the community.