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Application of Computational Fluid Dynamics Model to Disinfection Reactors in Water Reclamation Plants ANDREA HELMNS, PABLO TEXEIRA, EMIN ISSAKHANIAN, JOSE SAEZ, Loyola Marymount Univ — California's current drought has renewed public interest in recycled water from Water Reclamation Plants (WRPs). It is critical that the recycled water meets public health standards. This project consists of simulating the transport of an instantaneous conservative tracer through the chlorine contact tanks at two WRPs in California, where recycled water regulations stipulate a minimum 90-minute modal contact time during disinfection at peak dry weather design flow. Computational Fluid Dynamics (CFD) is used to model the turbulent flow, transport, and contact time of a conservative solute for several real operating scenarios. Given as-built drawings and operation parameters, the chlorine contact tanks are modeled to match actual geometries and flow conditions. The turbulent flow solutions are used as the basis to model the transport of a turbulently diffusing conservative tracer added instantaneously to the inlet of the reactors. This tracer simulates the transport through advection and dispersion of chlorine in the WRPs. Breakthrough curves of the tracer at the outlet are used to determine the modal contact times.

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