

## **Tres Valles West Case Study**

### **A preliminary report**

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This plant used water from a ground well that was then pumped into a holding tank. Next the water in holding tank was then filtered before being treated with chlorine. The contact tank used for the treated water consisted of two 1500-gallon tanks. Figure 1 is a schematic of the contact tank geometry model used in the computational fluid dynamics (CFD) model. In Figure 1 the top tank has an inlet pipe, which extends all the way to the back wall. This inlet was approximately 3 inches in diameter, while the outlet had a 6-inch diameter. The pipe joining the two tanks was 4 inches in diameter, however the exact length and geometry of this pipe was unknown. Since the pipe was buried in concrete and not included in the “As Built” drawings it was impossible to accurately model. The connection pipe shown in Figure 1 was simply a “best guess” of how the pipe looked. From here the flow then would go back through the tank into a pipe that fed the second tank. The treated water was then pumped out of this tank at 45 GPM and was then pumped to a storage tank.

After a preliminary CFD study of the system was performed to estimate the system’s baffling factor, a Lithium tracer study was performed. This tracer study was conducted such that the injection port of the tracer was very close to the injection port of the chlorine. Water samples were then taken off of a pressurized pipe directly after the effluent pump of the contact tank. Figure 2 shows the residence time distribution (RTD) curve from both CFD model of the system and the results of the lithium tracer study. During this test the initial flow depth was set to two feet in each tank, as this was the cut off point for the effluent pump. However during the tracer study the levels in the two tanks varied due to pressure losses from the pipe connecting the two tanks. Despite this discrepancy, the RTD curves match very well. Both the CFD results and the lithium tracer study show that the baffle factor of the system is approximately 0.4.

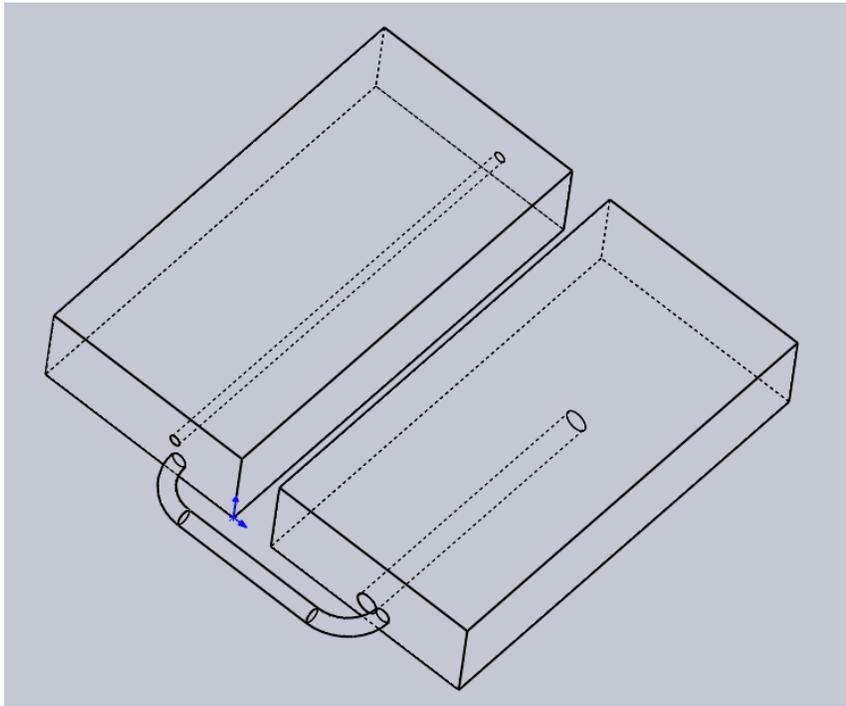


Figure 1. Tres Valles West Tank Geometry

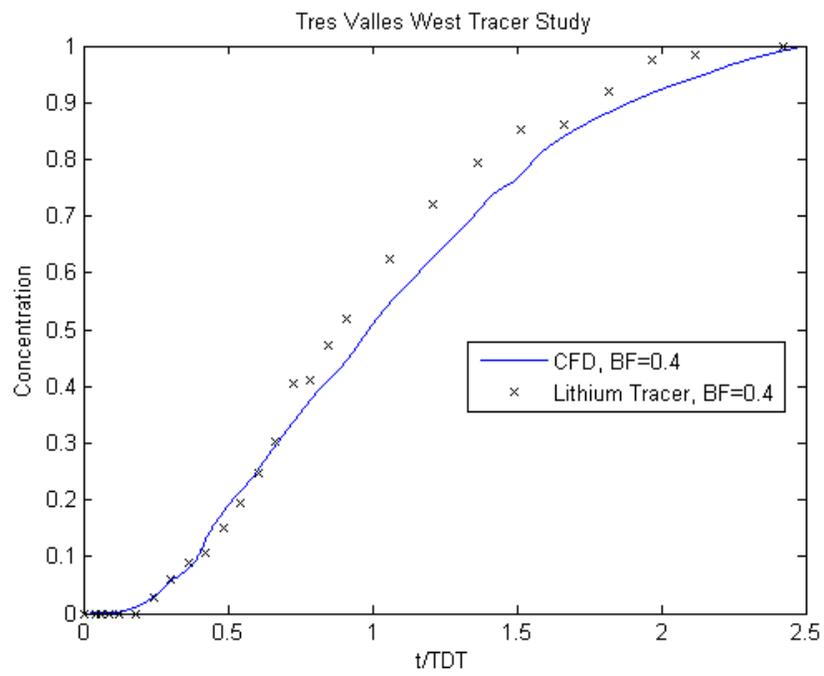


Figure 2. Tracer Study RTD Curves