

## Assay Metering and Pinch Valve Test for K Basin sludge removal

MCE provided testing support for the Hanford K Basins sludge removal activities. This test was a mockup of the process system and tested two key process operations. The first operation delivered metered discharges of sludge from the assay vessel to a waste drum. The second simulated transfer of sludge from the assay vessel to the corrosion vessel. Both operations were configured using a progressive cavity pump mounted horizontally, with the pump suction inlet nozzle directed upward. A mockup assay vessel was installed directly above the pump suction and connected through a 2-inch pipe. An air-operated pinch valve was installed in the suction line between the pump inlet and mockup assay vessel.

The progressive cavity pump and the pinch valve were identified as the two primary test articles, which were tested for operability and durability by repeatedly transferring simulant through the test configuration. Ten pumping transfers were performed to demonstrate that the pump could successfully transfer sludge simulant from the assay tank to the waste drum.

Ten additional transfers were performed to demonstrate the pump could successfully transfer sludge simulant from the assay tank to the corrosion vessel. Samples collected from the assay tank and pump discharge were compared to determine if the pump discharge sample was representative of the source material.



The progressive cavity pump was tested to demonstrate that sludge simulant could be accurately metered by monitoring and controlling the number of rotations of the pump rotor. Additional testing demonstrated recovery measures after a loss of flow scenario midway through a sludge simulant transfer to either the waste drum or corrosion vessel. The loss of flow condition was simulated by stopping the pump.

The pinch valve was tested to confirm its operation with sludge simulant flowing through the valve. The ability of the pinch valve to prevent solids from entering pump suction when the valve is closed was confirmed. The pinch valve air supply and process line pressures were compared to the manufacturer's published data.

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