Usalco

Proven under pressure: coagulation performance in a historic turbidity event

The Nevada water provider's quick action, crisis communications, and coagulation optimization avoided plant shut down, loss of filtration performance, and boil notices.

The city of Reno sits at the border of California and Nevada, with a backdrop of the Sierra Nevada mountains and nearby Lake Tahoe. Its natural beauty and casinos attract tourists and new residents every year.

Truckee Meadows Water Authority (TMWA) delivers drinking water to the more than 475,000 residents of Reno, Sparks, and greater Washoe County. It operates the Chalk Bluff and Glendale water treatment plants (WTP) along with multiple groundwater wells, with a total production capacity of 190 million gallons per day (MGD).

MONSOON SEASON

On August 26th and 27th, 2025, monsoons brought flash flood conditions to Reno. Rain fell as fast as one inch per hour, causing mudslides in the Truckee River watershed, the primary water source for TMWA. The river's turbidity soared from a typical five NTU (Nephelometric Turbidity Units) to 7,500 NTU at Chalk Bluff WTP's raw water intake, far exceeding the plant's normal upper treatment threshold of approximately 125 NTU.

This flooding event came nearly thirty years after a flood overwhelmed the plant with an average of 2,000 NTU that lasted four days in 1997. While TMWA maintained finished water quality throughout the event, operators acted swiftly to stabilize operations and restore production capacity while avoiding a plant shut down and boil notices. In addition to storage concerns, maintaining system pressure, and meeting customer demand during this time, TMWA faced two risks regarding their coagulation:

1. Overdosing and running out of coagulant before the next delivery.
2. Underdosing and degrading filter performance under high turbidity conditions.

SNAP INTO ACTION

Operators closed the Chalk Bluff WTP (78 MGD) intake gates to stop the high turbidity raw water from entering the plant and negatively impacting filtration performance in the anthracite coal and silica sand filters. They distributed groundwater to meet demand while the plant was idle.

Glendale WTP (30 MGD) received a more gradual but still challenging 2,500 NTU surge at its river water intake. Staff blended well water and surface water to achieve 550 NTU at the influent train, and then successfully coagulated and settled the solids using 120 parts per million (ppm) DelPAC® 2500 before filtration.

After the initial 7,500 NTU spike subsided, the Truckee River's turbidity fell to 2,500 NTU and Chalk Bluff's river intake was reopened. Then the plant's flow was reduced from 78 to 50 MGD to avoid frequent backwashing and reduced filtration efficiency.

Hours later, a second storm and mudslide brought another 2,500 NTU spike to the Chalk Bluff WTP, forcing operators to further reduce intake flow to 24 MGD. As the river's turbidity evolved, operators used their jar testing know-how to repeatedly adapt their coagulation strategy, dosing DelPAC® 2500 at 30 ppm in the pre-pond and 120 ppm during the coagulation stage.

OPERATIONAL RESILIENCE

TMWA managed operations through several major issues throughout the event.

1. Fish Springs project groundwater was rerouted to stabilize two pressure zones.
2. The Mount Rose WTP was shut down due to excess turbidity.
3. Power outages impacted the South Reno area of operations.
4. TMWA leveraged community cooperation to manage the high turbidity by working with local media to request customers reduce their water usage. Estimates show demand fell by around 40%, easing water production despite running their plants at partial capacity.

CALM AFTER THE STORM

By August 28th, the day after the second storm, TMWA's system returned to full capacity. Neither facility ran out of coagulant despite the high NTUs in the raw water, and Usalco prioritized a rush restock of the DelPAC® 2500 supply. TMWA's distribution system never lost pressure during the event, and finished water quality remained compliant throughout.

Despite extreme turbidity conditions, TMWA successfully maintained regulatory compliance, and preserved system pressure, demonstrating operational preparedness and effective treatment under highly challenging conditions.

TMWA's swift response to this event demonstrates operational resilience and effective crisis management in water treatment. Water providers can be prepared for water quality events like these by:

001 Stocking adequate coagulant inventory

002 Training operators how to optimize treatment dosing during water quality events

003 Establishing community communication channels to manage expectations and conservation efforts

004 Having plans to manage water storage and inventory levels in the distribution system

005 Understanding your plant's NTU operations range to ensure they are idled and re-activated properly

006 Purchasing high quality coagulants that can perform in emergency conditions

About Usalco

Water powers life. At Usalco, that means we believe only the best will do — cleaner water, smarter systems, and sustainable outcomes. Equipped with the best in water treatment solutions and innovations, Usalco goes farther and works harder to empower others, because when everything depends on water, you can depend on Usalco.